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PATENT LAW REVISION

HEARINGS
BEFORE THE
SUBCOMMITTEE ON
PATENTS, TRADEMARKS, AND COPYRIGHTS
OF THE
COMMITTEE ON THE JUDICIARY
UNITED STATES SENATE
NINETY-THIRD CONGRESS
FIRST SESSION

Pursuant to S. Res. 56

ON

S. 1321

SEPTEMBER 11, 12, AND 14, 1973



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**S. 1321—FOR THE GENERAL REFORM OF THE PATENT
LAWS, TITLE 35 OF THE UNITED STATES CODE, AND
FOR OTHER PURPOSES**

TUESDAY, SEPTEMBER 11, 1973

**U. S. SENATE,
SUBCOMMITTEE ON PATENTS, TRADEMARKS AND COPYRIGHTS
OF THE COMMITTEE ON THE JUDICIARY
*Washington, D.C.***

The committee met at 10 a.m., in room 1114, Dirksen Senate Office Building, Senator Philip A. Hart, presiding.

Present: Senator Hart (presiding).

Also present: Thomas C. Brennan, chief counsel, Dennis Unkovic, assistant counsel, Subcommittee on Patents, Trademarks and Copyrights, Bernard Nash, assistant counsel, Antitrust and Monopoly Subcommittee.

Senator HART. The committee will be in order.

Permit me first a brief opening statement. Then we will proceed to take testimony.

Beginning with the 1966 Report of the President's Commission on the Patent System, Congress undertook serious consideration of reforming our system for issuing patents. Many hours of testimony, and dozens of filed statements, have been received by this subcommittee since then on a number of bills designed to accomplish this important and difficult task.

Under the able chairmanship of the distinguished senior Senator from Arkansas, John McClellan, the subcommittee reported a solid reform bill in October 1971. Unfortunately, patent reform got no further because of the effort to tie antitrust exemptions for patent licensing agreements to patent reform.

No system designed in 1836 can remain viable under the economic and technological conditions of 1973. And that is why the patent system is under attack. Unless it is reformed to create procedures, safeguards, and mechanisms to weed out the bad patents before issuance—whether fraudulent or not—and to assure the expeditious and impartial issuance of patents that meet the constitutional and statutory standards, the patent system will die of atrophy.

I am pleased to chair what I expect to be the final hearings on patent reform before the subcommittee marks up a bill next month.

The bill under consideration, S. 1321, represents a distillation of prior reform bills, including the bulk of the 1971 subcommittee bill, the Presidential Commission recommendations, suggestions for reform made over the past years, and some European approaches. Although complicated, it is designed simply to raise the quality and

reliability of the U.S. patent by overhauling the system for issuing patents to promote the progress of science and the useful arts.

The hearings will concentrate on the five areas which either contain new reform proposals or have not been recently explored by the subcommittee. I would expect, however, that the subcommittee will consider all of its prior work and the views of the administration, if they should be forthcoming, in reporting out a reform bill.

Three days of hearings were originally scheduled for this Tuesday, Thursday, and Friday. As some of you know, the full Committee on the Judiciary has scheduled this Thursday to continue confirmation hearings on Mr. Ruckleshaus as Deputy Attorney General. Our Thursday session, accordingly, has been rescheduled for Wednesday. I apologize for the inconvenience. I am grateful that you were able and willing to cooperate on this problem.

Mr. BRENNAN. Mr. Chairman, on behalf of Senator McClellan, I would like to read a short statement. The chairman is otherwise occupied with his duties as chairman of the Appropriations Committee, and cannot attend this series of hearings. He has asked me to read the following statement:

The subcommittee today is commencing what is presently contemplated as the final series of hearings on legislation for the general revision of title 35.

There are significant differences of opinion concerning what reforms of the patent system are necessary and prudent. These differences have been reflected in the previous deliberations and actions of this subcommittee, and will undoubtedly occur in the further processing of this legislation. I have in the past supported, and will continue to support, such measures as are required to modernize the American patent system. I have in the past opposed, and will continue to oppose, measures which would reduce the incentives of the patent system, or make the system so cumbersome that it is less effective in achieving the objectives for which it was created.

A major factor contributing to the inconclusive nature of the prior action of the subcommittee has been the failure of the executive branch to formulate an administration position on patent law revision. On September 21, 1972, the Minority Leader and I addressed a joint letter to the President urging him to direct further efforts to produce an administration bill, including a statutory clarification of the rights of patent owners with respect to the licensing of their inventions.

Substantial progress has been made. I understand there is now an administration position on the issues being considered in these hearings. I have been assured that the executive branch will expeditiously complete the remaining work on the preparation of an administration bill. With the cooperation of the executive branch, the bar, and other interested parties, it should be possible for the subcommittee to report a patent revisions bill prior to the adjournment of the current session of the Congress.

Mr. Chairman, I ask unanimous consent to have printed at this point in the record the letter of the chairman and the minority leader to the President of the United States.

Senator HART. It will be printed.

[The letter referred to follows:]

SEPTEMBER 21, 1972.

The PRESIDENT,
The White House,
Washington, D.C.

MY DEAR MR. PRESIDENT: The 92nd Congress will be adjourning shortly without acting on the legislation to modernize the American Patent System. As you indicated in the Message on Science and Technology "a strong and reliable patent system is important to technological progress and industrial strength". We concur in your judgment that "we must make the most effective

possible use of the incentives which are provided by our patent system", if the private sector is to be adequately encouraged to invest funds and talent in the application of technology to the achievement of national goals.

We welcome the efforts currently being made to promote more effective utilization of American technology as the competition in world trade becomes ever more intense. But the testimony before our Subcommittee suggests that invention and innovation is being retarded by inadequate incentives, and the uncertainty which has developed concerning certain aspects of our patent system.

Because of the complexity and technical nature of patent legislation, it is difficult under the most favorable of circumstances to secure action in the Congress. Our task has been rendered significantly more burdensome by the inability of the executive branch to formulate a single position on the patent revision legislation, including a proposed statutory clarification of the rights of patent owners with respect to the licensing of their inventions. The absence of an Administration position has been exploited by some who wish to weaken and discredit the patent system.

We, therefore, request that you direct the appropriate departments and agencies of the executive branch to undertake renewed efforts to formulate an Administration position on patent law revision. We would hope that it will be possible for you to communicate this position upon the convening of the 93rd Congress.

With kindest personal regards.

Respectfully yours,

JOHN L. McCLELLAN,
Chairman.

HUGH SCOTT,
Ranking Republican Member.

Mr. BRENNAN. I further request permission, Mr. Chairman, to have printed at this point in the record the notice of this hearing and the text of S. 1321.

Senator HART. So ordered.

[The information referred to follows:]

[From the Congressional Record, Senate, July 31, 1973]

NOTICE OF HEARINGS ON PATENT LAW REVISION

Mr. McCLELLAN. Mr. President, as chairman of the Subcommittee on Patents, Trademarks, and Copyrights, I desire to announce that the subcommittee has decided to reopen the hearings on the general revision of the patent law, title 35.

The hearings are being reopened for the purpose of receiving testimony on various important new issues, such as are contained in S. 1321. The hearings will include the following subjects:

First, modification of patent examination proceedings to provide public adversary hearings;

Second, the creation of the Office of Public Counsel;

Third, establishment of a system for deferred examination of patent applications;

Fourth, revision of the patent fee schedule, including the establishment of maintenance fees; and

Fifth, administrative restructuring of the Patent Office, including the proposed establishment of the Patent Office as an independent agency.

The hearings will be held on September 11, 13, and 14 in room 1114 of the Dirksen Senate Office Building and will commence each day at 10 a.m.

Anyone desiring to testify during the hearings should contact the office of the subcommittee at 202-225-2268.

[S. 1321, 93d Cong. 1st Sess.]

A BILL For the general reform and revision of the patent laws, title 35 of the United States Code, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, in accordance with the authority granted by article 1, section 8, clause 8 of the United States Constitution, entitled "Patents", is hereby amended in its entirety to read as follows:

"TITLE 35—PATENTS

"Part	Sec.
"I. Patent Office -----	1
"II. Patentability of inventions and grants of patents -----	100
"III. Patents and infringement of patents -----	261

"PART I—PATENT OFFICE

"Chapter	Sec.
"1. Establishment, officers, functions -----	1
"2. Proceedings in the Patent Office -----	21
"3. Practice before the Patent Office -----	31
"4. Patent Office fees -----	41

"CHAPTER 1.—ESTABLISHMENT, OFFICERS, FUNCTIONS

"Sec.

- "1. National patent policy.
- "2. Establishment and seal.
- "3. Commissioner and other officers.
- "4. Restrictions on officers and employees as to interest in patents.
- "5. Board of Appeals.
- "6. Library, classification of patents, public search facilities.
- "7. Certified copies of records.
- "8. Publications.
- "9. Annual report to Congress.
- "10. Advisory Council on the Patent System.

"§ 1. *National patent policy*

"It is hereby declared to be the national patent policy of the United States to promote the progress of science and useful arts, by granting inventors the privilege, for a limited time and subject to the provisions of this title and any other Act the Congress has or may hereafter enact, to exclude others from making, using, and selling new and useful inventions discovered by such inventors and fully disclosed to the public. This title shall be interpreted in light of this policy and of the constitutional purpose permitting Congress to enact a patent law, to assure that United States patents are of high quality and reliable.

"§ 2. *Establishment and seal*

"The Patent Office, at times referred to in this title as the 'Office', shall be an independent agency, where records, books, drawings, specifications, and other papers and things pertaining to patents and to trademark registrations shall be kept and preserved, except as otherwise provided by law. The Patent Office shall have a seal with which letters patent, certificates of trademark registration, and papers issued from the Office shall be authenticated.

"§ 3. *Commissioner and other officers*

"(a) There shall be a chief administrative officer of the Patent Office, the Commissioner of Patents, referred to in this title as the 'Commissioner'. The Commissioner shall be appointed by the President, by and with the advice and consent of the Senate, and he shall be compensated at the rate now or hereafter provided for level IV of the Executive Schedule pay rates (5 U.S.C. 5315). The Commissioner shall superintend or perform all duties required by law respecting the granting and issuing of patents and the registration of trademarks, and he shall have charge of property belonging to the Patent Office. The Commissioner is authorized to promulgate rules and regulations governing proceedings before the Patent Office; to define any and all terms used in this title in connection therewith; and otherwise to prescribe such further rules and regulations as may be necessary or proper for purposes of administration of the Patent Office.

"(b) There shall be a Deputy Commissioner of the Patent Office, who shall be appointed by the President, by and with the advice and consent of the Senate, and who shall be compensated at the rate now or hereafter provided for level V of the Executive Schedule pay rates (5 U.S.C. 5316). The Deputy Commissioner shall perform such functions as the Commissioner may assign or delegate and he shall act as Commissioner during the absence or disability of the Commissioner or in the event of a vacancy in the Office of Commissioner.

"(c) There shall be no more than three Assistant Commissioners of the Patent Office, who shall be appointed by the Commissioner and who shall be compensated at a per annum rate of basic compensation fixed by him not in excess of the maximum scheduled rate provided for positions in grade 18 of the General Schedule (5 U.S.C. 5104). Such Assistant Commissioners shall perform such functions as the Commissioner may from time to time assign or delegate. In the event of vacancies in the offices of Commissioner and Deputy Commissioner, or their absence or disability, the Assistant Commissioner senior in date of appointment shall fill the office of Commissioner until said vacancies, absences, or disabilities terminate.

"(d) There shall in addition be an Assistant Commissioner of the Patent Office for Appeals, Litigation, and Public Counsel, referred to in this title as the 'Public Counsel', who shall be appointed by the President, by and with the advice and consent of the Senate. The position of Public Counsel shall be in the competitive service, and the per annum rate of basic compensation therefor shall not exceed the maximum scheduled rate provided for positions in grade 18 of the General Schedule (5 U.S.C. 5104). The Public Counsel shall assure an advocate, and through the adversary process, that high quality patents which meet the statutory and constitutional criteria therefor issue from the Patent Office. To that end he shall consider and review all proceedings in the Patent Office, and he or his delegates:

"(1) may intervene and participate at any time in any Patent Office proceeding, or appeal therefrom, when, in his discretion, it is necessary or appropriate to do so:

"(A) in the public interest to assure the integrity, strength, and reliability of a high quality patent system; or

"(B) in circumstances which indicate the public need to analyze or defend an important, new, or developing theory of law; or

"(C) in the case of important, new, or developing areas of technology; and

"(2) shall prosecute or defend appeals from any final action of the Patent Office; and

"(3) shall have all other rights and powers afforded parties under this title; and

"(4) shall take such other action, participate in such other proceedings, and conduct such other investigations or inquiries, as may be necessary or appropriate to carry out the purposes of this title.

The Commissioner may also assign or delegate other duties to the Public Counsel, to the extent such assignment or delegation does not interfere with the responsibilities of the Public Counsel provided by this subsection. In all other respects, the Public Counsel shall be independent of the Commissioner in carrying out his responsibilities hereunder.

"(e) The Commissioner shall, subject to other requirements of law, appoint other officers and employees of the Patent Office, assign or delegate to them the functions of the Office, and fix the per annum rate of basic compensation therefor.

"§ 4. *Restrictions on officers and employees as to interest in patents*

"Officers and employees of the Patent Office shall be incapable, during the period of their appointments and for three years thereafter, of applying for a patent or, during such period and for three years thereafter, being named as an inventor in an application for patent for an invention made during such period or for three years thereafter and of acquiring, directly or indirectly, except by inheritance or bequest, any patent or any right or interest in any patent, issued or to be issued by the Office. Such applications for patent thereafter shall not be entitled to any priority date earlier than three years after the termination of the appointment of such officers and employees.

"§ 5. *Board of Appeals*

"(a) There shall be in the Office not to exceed twenty-four examiners-in-chief, who shall be appointed under the competitive service, in the manner prescribed for Administrative Law Judges (5 U.S.C. 3105, 5362, 7521). The per annum rate of basic compensation of each examiner-in-chief shall be fixed at not in excess of the maximum scheduled rate provided for positions in grade 17 of the General Schedule (5 U.S.C. 5104).

"(b) The examiners-in-chief shall constitute a Board of Appeals in the Patent Office. The examiners-in-chief shall be persons of competent legal knowledge and scientific ability, who will perform and exercise the judicial functions of the Office.

"(c) The Board of Appeals shall review all final orders (as that term is defined in 5 U.S.C. 551) of primary examiners and may review orders issued pursuant to section 23 of this title, except with respect to such matters relating to Office procedure which the Commissioner has by general rule or regulation assigned for determination by a single member of the Board of Appeals, who shall from time to time be designated by the examiner-in-chief senior in date of appointment. Except as otherwise provided in this title, the Board of Appeals shall exercise all judicial functions, including all agency review or appeals, under this title. The order of the Board of Appeals shall constitute final agency action (as that term is defined in 5 U.S.C. 551) in all matters considered by it, as shall the order of a single member in matters assigned for determination by him.

"(d) Each appeal or other action shall be heard or considered by a panel of at least three members of the Board of Appeals, except as otherwise provided in subsection (c) of this section. Said panel shall be designated for each case by the examiner-in-chief senior in date of appointment, consistent with the provisions of section 3105, of title 5, United States Code. The Board of appeals has sole power to grant rehearings.

"(e) Whenever the Commissioner considers it necessary to maintain the work of the Board of Appeals current, he may designate any patent examiner of the primary examiner grade or higher having the requisite ability, to serve as examiner in chief for periods not exceeding six months each. An examiner so designated shall be qualified to act as a member of the Board of Appeals. Not more than one acting examiner in chief shall be a member of the panel of the Board of Appeals hearing any appeal or considering any case. The Commissioner is authorized to fix the per annum rate of basic compensation of each designated examiner in chief in the Patent Office at not in excess of the maximum scheduled rate provided for positions in grade 16 of the General Schedule (5 U.S.C. 5104). The per annum rate of basic compensation of each designated examiner in chief shall be adjusted, at the close of the period for which he was designated to act as examiner in chief, to the per annum rate of basic compensation which he would have been receiving at the close of such period if such designation had not been made.

"§ 6. Library, classifications of patents, public search facilities

"(a) The Commissioner shall maintain a complete and current library of patents and scientific and other works and periodicals, both foreign and domestic, in the Patent Office which shall be available to its employees in the discharge of their duties under this title and to assist the public in the study of science and the useful arts.

"(b) The Commissioner shall establish liaison with all Government agencies in order to make available in the Patent Office library additional scientific, technological, and other works and periodicals. Such material or copies thereof shall be provided to the Office by such agencies without charge if the Commissioner so requests. Upon request, the Commissioner shall provide other Government agencies, without charge, with copies of specified documents maintained in the custody of the Office.

"(c) The Commissioner shall maintain with appropriate revisions a current publicly available classification and index by subject matter of published specifications of United States patents and of such other patents and applications, whether abandoned or published, and other scientific and other works and periodicals, both foreign and domestic, as may be necessary for the purpose of determining with readiness and accuracy the patentability of subject matter for which applications for patent are filed.

"(d) The Commissioner shall maintain public facilities, in various parts of the United States, for the searching of prior art and patent materials, both foreign and domestic. To the maximum extent feasible, such prior art and patent materials shall be complete and current, drawing upon all relevant scientific, technological, and other works and periodicals, both foreign and domestic, available to any Government agency. The Commissioner shall have such prior art and patent materials classified and indexed according to the classification of patents.

"(e) To the maximum extent feasible, the Commissioner shall mechanize, or otherwise facilitate by electrical, mechanical, or other appropriate means, the search of such prior art and patent materials. The Commissioner shall conduct an ongoing program of research and development to keep the handling, classification, storage, and retrieval of such prior art and patent material current and up to the state of the art.

"§ 7. Certified copies of records

"The Commissioner shall, upon payment of the prescribed fee, furnish certified copies of records of the Patent Office within thirty days to persons entitled thereto.

"§ 8. Publications

"(a) The Commissioner shall cause to be published in a timely fashion in such format as he determines to be suitable, the following:

"(1) the specifications and drawings of patents, and patent applications, subject to the provisions of this title;

"(2) certificates of trademark registrations, including statements and drawings;

"(3) complete and current annual volumes of all current decisions of the Patent Office Board of Appeals and the Trademark Trial and Appeal Board in patent and trademark cases;

"(4) current classification manuals and indices of the classifications of patents.

"(b) The Commissioner may cause to be published, in such format as he determines to be suitable, the following:

"(1) Patent abstracts.

"(2) The Official Gazette of the United States Patent Office,

"(3) Annual indices of patents, published applications and of trademarks and information concerning the same,

"(4) Pamphlet copies of the patent laws and rules of practice, laws and rules relating to trademarks and circulars or other publications relating to the business Office.

"(c) The Commissioner may exchange any of the publications specified in subsections (a) and (b) of this section for publications desirable for the use of the Patent Office, and furnish copies of any of these publications to international intergovernmental organizations of which the United States is a member.

"(d) The Commissioner may supply copies of specifications and drawings of patents to public libraries in the United States which shall maintain such copies for the use of the public, at the rate for each year's issue prescribed by the Commissioner in accordance with section 41(a) of this title.

"(e) The Patent Office may print the headings of the drawings for patents for the purpose of photolithography.

"(f) The Commissioner may establish a public information service for the dissemination to the public of information concerning patents and trademarks, and may from time to time disseminate or provide for dissemination of public technological and other public information, the publication of which in his judgment would promote the progress of science and the useful arts. Such dissemination may be made by periodical or other publications, the preparation and display of exhibits, and other appropriate means.

"§ 9. Annual report to Congress

"The Commissioner shall report to Congress annually the money received and expended, statistics concerning the work of the Office, an evaluation of the overall quality of the patents issued (including court decisions related to the validity and enforcement of patents), and other information relating to the Office as may be useful to the Congress or the public. Such statistics shall evaluate current patterns (as well as historical development over time) of patent and trademark ownership, grouped by economic categories of ownership, significance and type of technology involved, and geographic origin.

"§ 10. Advisory Council on the Patent System

"(a) There shall be an Advisory Council on the Patent System (referred to in this section as the 'Council') of not less than twelve nor more than twenty-four members to be appointed by the President, by and with the ad-

vice and consent of the Senate, from the general public, without regard to the civil service laws, and to consist of persons representing each of the sectors affected by the patent system, including manufacturers, scientists, engineers, consumers, legal scholars, jurists or former jurists, and representatives of Federal agencies involved in the promotion of science and useful arts, the administration of the patent system, and the enforcement of Federal law. The President shall designate the Chairman of the Council and set the term of members.

"(b) It shall be the duty of the Council, on a continuing basis, to evaluate the effectiveness of the patent system in serving the public interest; to analyze the contemporary conditions and needs of the patent system; to study and appraise the methods and operations of the United States Patent Office including the quality of United States patents; and to report to the Commissioner and the Congress its conclusions and recommendations.

"(c) The Commissioner shall furnish to the Council such professional, secretarial, clerical, and other services and facilities as the Chairman of the Council deems necessary to the conduct of its business. The Chairman of the Council shall appoint an executive secretary, the basic rate of compensation for whom shall not exceed the maximum scheduled for positions in grade 15 of the General Schedule (5 U.S.C. 5104), and such compensation shall be charged to the appropriation of the Patent Office.

"CHAPTER 2.—PROCEEDINGS IN THE PATENT OFFICE

"Sec.

"21. Day for taking action falling on Saturday, Sunday, or holiday.

"22. Form of papers filed.

"23. Issue of subpoenas and other orders by Patent Office; review and enforcement.

"24. Issue of subpoenas and other orders by Public Counsel.

"25. Oath and declaration in lieu of oath.

"26. Effect of defective execution.

"§ 21. *Day for taking action falling on Saturday, Sunday, or holiday*

"When the day, or the last day, for taking any action or paying any fee in the United States Patent Office, or as otherwise provided in this title, falls on Saturday, Sunday, a holiday within the District of Columbia, or on any other day the Patent Office is closed for the receipt of papers, the action may be taken, or the fee paid, on the next succeeding secular or business day.

"§ 22. *Form of papers filed.*

"The Commissioner may by regulation prescribe the form of papers filed in the Patent Office.

"§ 23. *Issue of subpoenas and other orders by Patent Office; review and enforcement*

"(a) Any party of record in any Patent Office proceeding may apply at any time to the primary examiner or other presiding official for subpoenas or other orders to provide discovery, testimony, or evidence, and he shall issue the same ex parte. The primary examiner or any member of the Board of Appeals may also issue such subpoenas or orders on his own motion, in any proceeding. Such subpoenas and orders may issue against the applicant or any person within the jurisdiction of the United States, whether or not he is a party of record.

"(b) (1) The Commissioner shall establish rules for taking such discovery, testimony, and evidence. Such rules shall provide the parties of record all discovery permitted, and the sanctions for noncompliance therewith prescribed, in the Federal courts pursuant to the Federal Rules of Civil Procedure, as procedural necessities within the Office permit. Such rules shall provide, further, for the payment of witness fees and expenses as prescribed for proceedings in the district courts.

"(2) The Commissioner shall also establish rules governing inter partes proceedings by which subpoenas and orders issued pursuant to subsection (a) of this section may be sustained, quashed, or modified.

"(c) (1) Agency action pursuant to subsections (a) and (b) of this section shall not be deemed final decisions or orders for the purposes of chapter 13 of this title. Judicial review of such orders may be had upon review of the

final decision or order in the entire proceeding, pursuant to chapter 13 of this title, or as may otherwise be required by sections 701-706 of title 5, United States Code. Judicial review of agency action pursuant to subsections (a) or (b) of this section may also be had in the course of a civil enforcement proceeding. Such proceeding may be by way of application by any party aggrieved by refusal or failure to comply with a subpoena or order issued pursuant to subsections (a) or (b) of this section, to the United States District Court for the District of Columbia, for an order to show cause why the person refusing or failing to comply with such subpoena or order should not be commanded by the court to comply therewith.

"(2) The process of such district court for such purpose shall run throughout the United States and otherwise as provided by the Federal Rules of Civil Procedure or any Federal statute.

"(3) Disobedience to any court order entered pursuant to this subsection shall be punishable as a contempt.

"§ 24. Issue of subpoenas and other orders by Public Counsel

"(a) The Public Counsel may issue a subpoena or order to any applicant, patentee, or any person within the jurisdiction of the United States, requiring him—

"(1) to appear before a designated representative of the Office, in a nonadjudicative proceeding, to testify, produce documentary evidence, or produce other information or material; or

"(2) to file reports or answers in writing to specific questions—relating to any matter under investigation or inquiry by the Public Counsel, or likely to lead to the production of information relating thereto, whether or not the subject matter of the investigation or inquiry may also be involved in any proceeding before a primary examiner or the Board of Appeals, or any other proceeding before any court or other tribunal.

"(b) Agency review of subpoenas or orders issued pursuant to this section shall be before the Public Counsel, in accordance with such rules as the Patent Office may prescribe.

"(c) In the case of disobedience to or failure to comply with such subpoenas or orders, the Public Counsel may, in his discretion, seek enforcement thereof by the procedure specified in section 23(c) of this chapter, and the procedures specified therein shall be applicable to subpoenas and orders entered pursuant to this section. The Public Counsel or his delegate shall be authorized to appear before the court and institute any such proceeding pursuant to this subsection, notwithstanding any other provisions of law.

"§ 25. Oath and declaration in lieu of oath

"(a) An oath to be filed in the Patent Office may be made before any person within the United States authorized to administer oaths, or before any officer authorized to administer oaths in the foreign country in which the affiant may be, whose authority shall be proved by certificate of a diplomatic or consular officer of the United States, and such oath shall be valid if it complies with the laws of the State or country where made.

"(b) The Commissioner may by regulation prescribe that any document to be filed in the Patent Office and which is required by any law or regulation to be under oath may be subscribed to by a written declaration in such form as the Commissioner may prescribe, such declaration to be in lieu of the oath otherwise required.

"(c) Whenever such written declaration is used, the document must warn the declarant that willful false statements and the like are subject to punishment including fine or imprisonment, or both (18 U.S.C. 1001).

"(d) Whenever the affiant or declarant does not use English as his primary language, the oath or declaration shall be made in his primary language and shall be filed with an English translation, the accuracy of which shall be attested pursuant to such rules as the Commissioner may prescribe.

"§ 26. Effect of defective execution

"Any document to be filed in the Patent Office and which is required by any law or regulation to be executed in a specified manner may be provisionally accepted by the Commissioner despite a defective execution, provided a properly executed document is submitted within such time as may be prescribed by the Commissioner, not to exceed six months.

"CHAPTER 3.—PRACTICE BEFORE THE PATENT OFFICE

"Sec.

"31. Regulations for agents and attorneys.

"32. Suspension or exclusion from practice.

"33. Unauthorized representation as practitioner.

"§ 31. *Regulations for agents and attorneys*

"The Commissioner may prescribe regulations governing the recognition and conduct of agents, attorneys, or other persons representing applicants or other persons before the Patent Office, and may require them, before being recognized as representatives of applicants or other persons, to show that they are of good moral character and reputation and are possessed of the necessary qualifications to render to applicants or other persons valuable service, advice, and assistance in the presentation or prosecution of their applications or other business before the Office.

"§ 32. *Suspension or exclusion from practice*

"The Patent Office may, pursuant to such rules and regulations as the Commissioner shall prescribe, suspend, or exclude, either generally or in any particular case, from further practice before the Office, any person, agent, or attorney shown to be incompetent or disreputable, or guilty of gross misconduct, or who does not comply with the regulations established under section 31 of this chapter, or section 115 of this title, or who shall, by word, circular, letter, or advertising, with intent to defraud in any manner, deceive, mislead, or threaten any applicant or prospective applicant, or other person having immediate or prospective business before the Office. The decision of the agency shall be determined on the record after notice and opportunity for an agency hearing, and shall be subject to the provisions of sections 551-559 of title 5, United States Code. The United States District Court for the District of Columbia, under such conditions and upon such proceedings as it by its rules determines, may review the final action of the agency upon the petition of the person so suspended or excluded, and such suspension or exclusion shall be set aside if unsupported by substantial evidence or otherwise not in accordance with law.

"§ 33. *Unauthorized representation as practitioner*

"(a) Whoever, not being recognized to practice before the Patent Office, holds himself out or permits himself to be held out as so recognized, or as being qualified to prepare or prosecute an application for patent, shall be fined not more than \$1,000 for each offense.

"(b) Where an agent, attorney, or firm recognized to practice before the Patent Office, assumes responsibility for the service of preparing or prosecuting a patent application at the time such service is rendered, the service shall be considered as performed by such agent, attorney, or firm within the meaning of this section.

"CHAPTER 4.—PATENT OFFICE FEES

"Sec.

"41. Patent Office fees.

"42. Payment of fees; return of excess amounts; review of budget.

"§ 41. *Patent Office fees*

"(a) The Commissioner shall prescribe by regulations the fees to be paid in connection with the filing and examination of patent and trademark applications, the issuance of patents, the maintenance of patents in force, the supply of copies of records, the furnishing of publications or other services furnished by the Patent Office, and any other matters set forth in this title or in the Trademark Act of 1946 (60 Stat. 427; 15 U.S.C. 1051), as amended, requiring a fee; and the time within which such fees shall be paid.

"(b)(1) Fees shall be designed to affect an overall recovery in the range of 65 to 75 per centum of the costs of operation of the Patent Office: *Provided*, however, for a patent with one claim in independent form, and with no more than nine additional dependent claims, the application fee, issue fee, and annual maintenance fee (for the first three years thereof) shall not exceed \$100.

"(2) The Commissioner shall by regulation prescribe fee exemptions on a progressively graduated basis, not to exceed 50 per centum of filing and exami-

nation fees and 80 per centum of maintenance fees, to benefit and encourage individual inventors and small businessmen.

"(c) (1) Beginning the fourth year after a patent issues, the maintenance fee thereon shall be no less than \$1,000, and shall increase annually by at least 25 per centum each year, except as may be provided pursuant to subsection (b) (2) of this section.

"(2) The Commissioner by regulation may in whole or in part defer payment of accrued maintenance fees for up to four years from the date of issuance, and he may waive such fees if such patent is disclaimed or canceled before the commencement of the fifth year. Additionally, a member of the Board of Appeals, pursuant to section 5(c) of this title, may extend such four-year period up to ten years, in individual cases, if the patentee establishes, by a preponderance of proof that he—

"(A) has made a good faith effort commercially to work the subject matter patented and that such efforts were without success due solely to circumstances beyond his control; or

"(B) is otherwise unable to pay any fee charged for maintaining an issued patent in force.

"(d) If payment of the fees in connection with the examination, publication, or issuance of a patent application, or the maintenance of a patent, are not timely made, the application shall be regarded as abandoned, or the patent canceled (and notice of such cancellation shall be endorsed on copies of the specification of the patent thereafter distributed by the Patent Office). An applicant shall be given at least thirty days, and no more than six months, following notice of a fee due in which to pay the fee, except as otherwise provided in this title.

"(e) Except as otherwise provided in this title, the fees established under the authority of this section shall apply to any other Government department or agency, or officer thereof, except that the Commissioner may waive the payment of any fee for services or materials in cases of occasional or incidental requests by a Government department or agency, or officer thereof.

"(f) The Commissioner may prescribe by regulations that copies of Patent Office records and publications may be provided without charge, or at reduced or nominal fees, to libraries or other similar bodies, or in exchange for records or publications of foreign countries.

"§ 42. *Payment of fees; return of excess amounts; review of budget*

"(a) All fees shall be paid to the Commissioner who shall deposit the same in the Treasury of the United States in such manner as the Secretary of the Treasury directs.

"(b) The Commissioner may refund any sum paid by mistake or in excess of the fee required.

"(c) The Office of Management and Budget shall not inspect, examine, audit, or review the subpoenas, orders, records, work, congressional recommendations, or testimony of the Patent Office or the Public Counsel or comment on any budget request made by the Office, any other provision of law to the contrary notwithstanding. The Comptroller General shall conduct such reviews, audits, and evaluations of the Office as he deems necessary. All accounts, budgets, and records of the Office shall be submitted to the General Accounting Office from time to time as the Comptroller General may require, and the Office shall maintain, preserve, and make available for inspection by the General Accounting Office such records as the Comptroller General may require.

"PART II—PATENTABILITY OF INVENTIONS AND GRANT OF PATENTS

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"CHAPTER 10.—PATENTABILITY OF INVENTIONS

"Sec.

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"103. Conditions for patentability; nonobvious subject matter.

"104. Date of invention; priority.

"§ 100. *Definitions*

"When used in this title, unless the context otherwise indicates—

"(a) The term 'invention' means invention or discovery.

"(b) The term 'process' means process, art, or method and includes a new use of a known process, machine, manufacture, composition of matter, or material.

"(c) The terms 'United States' and 'this country' mean the United States of America, its territories, and possessions, and the Commonwealth of Puerto Rico.

"(d) The term 'applicant' means any person who owns an application for a patent, as provided in this title.

"(e) The term 'patentee' includes not only the person to whom the patent was issued but also the successors in title to such person.

"(f) The term 'actual filing date in the United States' includes the filing date to which an application or patent, or the subject matter of any claim thereof, may be entitled under the provisions of section 120 of this title (and excludes any date under section 119 of this title). An application or the resulting patent may contain separate claims for subject matter having different actual filing dates in the United States by virtue of the provisions of section 120 of this title or may contain claims entitled to the benefit of a prior date under the provisions of section 119 of this title, in addition to claims not so entitled.

"(g) The terms 'manufacture', 'composition of matter', and 'new and useful improvement thereof' do not include any known manufacture or composition of matter, any obvious variation of or on such known composition of matter or the structure thereof, or any conventional formulation or preparation of any of the foregoing or of any material, whether or not the same is adapted for practicing a new use thereof.

"(h) The term 'party' includes any agency (as that term is defined in 5 U.S.C. 551(a)), the United States, the Public Counsel, the government of the District of Columbia, any State or political subdivision thereof, or any agency or instrumentality thereof, and any person who is or may be adversely affected by any action (as that term is defined in 5 U.S.C. 551(g)), of the Patent Office.

"§ 101. *Subject matter patentable*

"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, or his successor in title, may obtain a patent therefor, subject to the conditions and requirements of this title.

"§ 102. *Conditions for patentability; novelty and bars to patent*

"A person shall not be entitled to a patent if the subject matter sought to be patented—

"(a) was known or used by others in this or a foreign country, or was patented or described in printed or other tangible form in this or a foreign country, before the invention thereof by the inventor named in the application, or

"(b) was patented or described in printed or other tangible form in this or a foreign country, or was in public use or on sale in this or a foreign country, more than one year prior to the actual filing date of the application for the patent in the United States, or

"(c) was forfeited, suppressed, or concealed by him, or

"(d) was first patented or caused to be patented by, or was the subject of an inventor's certificate issued to, the applicant or his legal representatives, assigns, or predecessors in title in a foreign country prior to the actual filing date of the application for patent in the United States, on an application for patent or inventor's certificate filed more than twelve months before the actual filing date of the application in the United States, or

"(e) was described in a published or publicly available United States patent application or United States patent, which has an actual filing date in the United States (or a prior filing date arising under section 119 of this title) before the invention thereof by the inventor named in the application, or

"(f) was not invented by the person named as inventor in the application, or

"(g) was invented by another person before the alleged invention thereof by the inventor named in the application, unless such other person himself suppressed or concealed it or has terminated activity with respect to the subject matter in circumstances establishing his intent not to resume such activity.

"§ 103. Conditions for patentability; nonobvious subject matter

"A patent may not be obtained though the subject matter sought to be patented is not disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

"§ 104. Date of invention; priority

"(a) No date of invention shall be accorded any applicant, with respect to the subject matter of this part of this title, which is more than one year earlier than the date on which his application was filed or, in the case of a continuing application, more than one year earlier than the date on which his immediately preceding parent application was filed.

"(b) The Office shall determine priority of invention between or among applicants for claims on substantially the same subject matter on the basis of rules and regulations which the Commissioner shall prescribe, in accordance with the procedures specified pursuant to section 136 of this title. Such rules and regulations shall make dispositive the respective dates of filing, first, and reduction to practice, second, insofar as the same is consistent with subsection (a) of this section.

"(c) An applicant who seeks to establish patentability based on a showing of any novel or unexpected property or result of the substantial superiority of any known or obvious property or result shall be entitled to claim priority for, or otherwise rely on, an application (whether filed in the United States or in a foreign country), only if it discloses each and every such property or result so relied upon.

"(d) To constitute disclosure or description for the purposes of sections 102 and 103 of this chapter, any description of any manufacture or composition of matter need not describe or disclose how to make or use such manufacture or composition of matter.

"(e) Patentability shall not be found in the perception of a problem the solution of which is obvious.

"CHAPTER 11.—APPLICATION FOR PATENT

"Sec.

"111. Application for patent.

"112. Specification.

"113. Drawings.

"114. Models, specimens.

"115. Oath of invention.

"116. Joint inventors.

"117. Death or incapacity of inventor.

"119. Benefit of earlier filing date in foreign country; right of priority.

"120. Benefit of earlier filing date in the United States.

"122. Public availability, publication and confidential status of application.

"§ 111. Application for patent

"(a) An application for patent may be filed by any person claiming to have invented the subject matter sought to be patented, or his assignee or other successor in title. The application shall be made in writing to the Commissioner, shall be signed by the applicant and include the name of each person believed to have made an inventive contribution, and shall be accompanied by the prescribed fee. An application filed by a person not the inventor shall

include, at the time of filing, a statement of the facts supporting the allegation of assignment and ownership of the subject matter sought to be patented.

"(b) An application for patent shall include—

"(1) a specification as prescribed by section 112 of this chapter;

"(2) a drawing as prescribed by section 113 of this chapter;

and

"(3) an oath as prescribed by section 115 of this chapter.

"(c) When the application is signed by or on behalf of the assignee, or other successor in title, he shall, within thirty days after filing an application for patent, serve a copy of the application on the inventor along with a statement calling the inventor's attention to the provisions of subsection (d) of this section. Service may be effected by mailing a copy of the application and statement, by first-class mail, to the last known address of the inventor. Failure to serve a copy of the application and statement on the inventor within thirty days shall result in abandonment of the application. The Commissioner may by regulation require proof of such service, and may extend the thirty-day period or waive the requirement for service upon a showing of sufficient cause.

"(d) An inventor, within a time prescribed by the Commissioner, may furnish a verified written notice to the Commissioner alleging that the applicant is not the assignee of the subject matter of the application as required by subsection (a) of this section. The Commissioner, in accordance with such regulations as he establishes and on the applicant's compliance with the requirement of this title, shall issue a patent to the inventor filing such written notice, without prejudice to later judicial proceedings, unless the notice is withdrawn by the inventor or the applicant records in the Patent Office an assignment by the inventor, or in lieu thereof, files a written statement by the inventor consenting to the filing of the application by and the issuance of the patent to the applicant.

"(e) Notice to the Commissioner, in a manner prescribed by regulations, of a final decision in a judicial proceeding in a court having jurisdiction thereof, from which no appeal has or can be taken, that an applicant is the assignee or owner of the subject matter of the application shall constitute an assignment to such applicant of his application therefor.

"§ 112. Specification

"(a) The specification shall contain a written description of the subject matter sought to be patented: of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same; and of all its novel or unexpected properties or results, and all its substantially superior known or obvious properties or results, on which patentability is to be based or upheld. The specification shall include each date or dates of invention, for each claim thereof, on which the applicant intends to rely, including any date of reduction to practice. The specification shall further include as a separate portion thereof, designated as such, a description of the best modes known or contemplated by the inventor and applicant of making, using, and commercially working the subject matter sought to be patented, together with all know-how known to the inventor and applicant necessary or commercially requisite to make use, and work the same. The primary examiner may require the applicant to support any factual assertion with empirical data and by an affidavit from an affiant with personal knowledge of the facts thereof.

"(b) The specification shall specifically note what is known to the inventor and applicant to be conventional or old, or which is obvious therefrom and it shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor regards as his invention. Any new use of a known machine, manufacture, composition of matter, or material must be claimed as a process (as defined in section 100(b) of this title), and may not be claimed as a machine, manufacture, or other product. The claim or claims must include only matter set forth in the remainder of the specification. The range of equivalents to which any element of any claim shall be accorded shall be that expressly set forth in the specification as relating thereto. A claim may be written in independent or, if the nature of the case admits, in dependent form. If the claim is in dependent form, it shall

be construed to include all the limitations of the claim incorporated by reference into the dependent claim.

"(c) An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital in the claim of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification.

"(d) Where the nature of the case admits, any independent claim shall contain, in the following order:

"(1) a preamble including a description of all the elements or steps of the claimed subject matter which are conventional or old,

"(2) a phrase such as 'wherein the improvement comprises,' and

"(3) those elements, steps, and/or relationships among them and/or between them and the elements or steps set forth in the preamble, which constitute that portion of the subject matter of the claim embodying the inventive contribution.

No claim shall consist of a mere aggregation of a number of old parts or elements, or steps, some or all of which, in the aggregation, perform or produce, or act together to perform or produce, no new or different function or operation than that theretofore performed or produced by such old parts or elements, or steps. Where an improvement is in one part or element of an old combination, or step of an old process, the improvement shall be claimed as such and shall not be claimed as a combination with other old parts or elements, or steps, which perform no new function in the combination.

"(e) When the subject matter sought to be patented relates to a process involving the action of a micro-organism not already known and available to the public or to a product of such a process, the written description required by subsection (a) of this section shall be sufficient as to said micro-organism, if—

"(1) not later than the date that the United States application is filed, an approved deposit of a culture of the micro-organism is made by or on behalf of the applicant or his predecessor in title, and

"(2) the written description includes the name of the depository and its designation of the approved deposit and, taken as a whole, is in such descriptive terms as to enable any person skilled in the art to which such subject matter pertains to make and use the best mode known or contemplated by the inventor and applicant of making, using, and commercially working the same.

An approved deposit shall be a deposit which—

"(1) is made in any public depository in the United States which shall have been designated for such deposits by the Commissioner of Patents by publication, and

"(2) is available, except as otherwise prohibited by law, in accordance with such regulations as may be prescribed,

"(A) to the public upon issuance of a United States patent to the applicant or his predecessor or successor in title which refers to such deposit, or

"(B) prior to publication of said patent, as specified in section 122 of this title.

"(f) For the dissemination of information and other purposes, the Commissioner, in accordance with such regulations as he establishes, may require a brief abstract of all or part of the application. The abstract shall not be used for interpreting the scope of any claims of a patent, nor shall it affect in any way the validity or infringement of the patent.

"§ 113. *Drawings*

"When the nature of the case admits, the applicant shall furnish a drawing.

"§ 114. *Models, specimens*

"(a) The primary examiner may require the applicant to furnish a model of convenient size to exhibit advantageously the several parts of the subject matter sought to be patented.

"(b) The primary examiner may also require the applicant to furnish specimens or ingredients for the purpose of inspection or experiment.

"(c) For the purpose of carrying into effect the provisions of this title with respect to any drug or subject matter for which therapeutic utility is asserted by the applicant, the Commissioner of the Food and Drug Administration shall, upon request of the Patent Office and notwithstanding any other provision of law:

"(1) furnish all information of, and available to, the Food and Drug Administration,

"(2) conduct through the appropriate bureau or division of the Food and Drug Administration research upon special problems (including evaluation of the utility, safety, or efficacy of such drugs), and

"(3) detail to the Patent Office officers and employees of the Food and Drug Administration as may be necessary to accomplish the purposes of this title.

"§ 115. *Oath of invention*

"(a) The inventor, the applicant, if not the inventor, and each of the agents, or attorneys or other persons recognized under section 31 of this title who participated in the preparation or prosecution of the application, or in any other proceeding before the Patent Office, has an uncompromising duty to act with the highest degree of candor and good faith toward the Patent Office and to disclose to the Patent Office (i) all information known to him concerning possible fraud or inequitable behavior underlying the application in issue and (ii) all information known to him necessary to make the application as a whole not misleading. Additionally:

"(1) Each inventor, at the time the application is filed, shall make oath that he believes himself to be the original and first inventor, and that he is aware of no prior public use or other material information which would adversely affect the issuance of the patent to the applicant; and shall state of what country he is a citizen. The inventor, after the notice of allowance, shall reaffirm the original oath and further make oath that he is aware of no prior art or other information that he in good faith believes to be more pertinent than that considered by the Patent Office. In an application for patent for an invention naming two or more inventors, each inventor shall specifically identify to which claim or claims he had made an inventive contribution.

"(2) Each applicant, if he is not the inventor, shall himself, or, in the case of a corporation or other business entity not a natural person, by one or more directors, officers, employees, or agents thereof who has knowledge of the subject matter covered by the oath and with authority to make an oath on behalf of the applicant, shall, after notice of allowance, make oath that he has no reason to believe the inventor not to be the original and first inventor, that he is aware of no prior art that he in good faith believes to be more pertinent than that considered by the Patent Office, and that he is aware of no prior public use or other material information which would adversely affect the issuance of the patent to him; such oath shall verify the statement of facts supporting the allegation of ownership of, or the right otherwise to file an application for, the subject matter sought to be patented.

"(3) Each agent, attorney, or other person recognized under section 31 of this title who participated in the preparation or prosecution of the application as shall be required by the Commissioner for purposes of carrying out this section shall, after notice of allowance, file a statement that he has no reason to believe the inventor not to be the original and first inventor, that he is aware of no prior art that he in good faith believes to be more pertinent than that considered by the Patent Office, and that he is aware of no prior public use or other material information which would adversely affect the issuance of the patent to the applicant.

"(b) The Commissioner shall prescribe such rules and regulations as may be necessary or proper for carrying out the purposes of this section, including the form and content of any oath and statement herein required.

"(c) Whenever an inventor, applicant, agent, attorney, or other person recognized under section 31 of this title refuses to execute any oath or statement required by subsection (a) of this section, or cannot be found or reached after diligent effort, the inventor or a person to whom the inventor has assigned or agreed in writing to assign the subject matter sought to be patented, or who otherwise shows sufficient proprietary interest in the matter

justifying such action, shall file in lieu of said oath or statement an affidavit proving the pertinent facts and showing that such action is necessary to preserve his rights or to prevent irreparable damage.

"(d) The applicant of an application filed pursuant to section 117 of this title shall make the oath required by subsection (a) of this section, so varied in form that it can be made by him.

"(e) Every oath or statement required by subsection (a) of this section shall be submitted not later than the time of payment of the fee required under the provisions of section 151(a) of this title.

"§ 116. Joint inventors

"(a) When two or more persons have made inventive contributions to subject matter claimed in an application, they shall apply for a patent jointly and each sign the application and make the required oath, or, if the application is filed by some other person having the right to do so, they shall be named as the inventors.

"(b) In an application for patent naming two or more inventors, it shall not be necessary for each person named as an inventor to be a joint inventor of the subject matter asserted in any claim.

"(c) If a joint inventor refuses to join another inventor in an application for patent, or cannot be found or reached after diligent effort, the application may, subject to the requirements of section 111 of this title, be made by the other inventor on behalf of himself and the omitted inventor. The Patent Office, in such proceedings as the Commissioner shall by regulation prescribe and after notice to the omitted inventor as he prescribes, may grant a patent to the inventor making the application, subject to the same rights which the omitted inventor would have had if he had been joined. The omitted inventor may subsequently join in the application.

"§ 117. Death or incapacity of inventor

"Legal representatives of deceased inventors and of those under legal incapacity may make application for patent upon compliance with the requirements and on the same terms and conditions applicable to the inventor, and may proceed on behalf of the inventor under the provisions of section 111(d) of this title.

"§ 119. Benefit of earlier filing date in foreign country; right of priority

"(a) If an applicant seeks to obtain a patent on subject matter disclosed in an application previously filed in a foreign country, he shall, subject to the provisions of this section, be entitled to such earlier foreign filing date, if—

"(1) such foreign application was filed by the applicant, or the predecessor or successor in title thereto; and

"(2) the subject matter common to the two applications, and on which the applicant seeks a United States patent, was expressly disclosed in such foreign application in the manner required by section 112(a) of this chapter; and

"(3) the subject matter of the two applications has the same inventor for the common claims thereof; and

"(4) the application filed in the United States was filed within twelve months after the earliest date on which such foreign application was filed; and

"(5) such foreign application was regularly filed in a foreign country which affords similar privileges in the case of applications filed in the United States or to citizens of the United States.

"(b) No application shall be entitled to a right of priority under this section unless a claim therefor is made in the specification at the time of filing the application, and a certified copy of the original foreign application, specification, and drawings, upon which it is based is filed in accordance with regulations established by the Commissioner, not later than the time of payment of the fee specified in section 151 of this title. An applicant shall not be required to file such certified copy earlier than three months after the actual filing date of the application in the United States. Certification shall be made by the Patent Office of the foreign country in which filed and show the date of the application and of the filing of the specification and other papers. The Commissioner may require translation of the papers filed if not

in the English language and such other information as he deems necessary.

"(c) In like manner and subject to the same conditions and requirements, the right provided in this section may be based upon a subsequent regularly filed application in the same foreign country instead of the first filed foreign application: *Provided*, That any foreign application filed prior to such subsequent application has been withdrawn, abandoned, or otherwise disposed of without having been laid open to public inspection and without leaving any rights outstanding, and has not served, nor thereafter shall serve, as a basis for claiming a right of priority.

"(d) When the application claiming priority under this section, discloses subject matter relating to a process involving the action of a micro-organism not already known and available to the public or to a product of such a process and an approved deposit is made under section 112(e) of this title, the approved deposit shall be considered to have been made on the earliest date that an application in a foreign country, the priority of which is being claimed, contains a reference identifying a deposit of the same micro-organism made in a public depository.

"(e) Applications for inventors' certificates filed in a foreign country in which applicants have a right to apply, at their discretion, either for a patent or for an inventor's certificate shall be treated in this country in the same manner and have the same effect for purpose of the right of priority under this section as applications for patent, subject to the same conditions and requirements of this section as apply to applications for patent: *Provided*, That such applicants are entitled to the benefits of the Stockholm Revision of the Paris Convention at the time of such filing.

"§ 120. Benefit of earlier filing date in the United States

"(a) If an applicant seeks to obtain a patent on subject matter disclosed in an application previously filed in the United States, he shall, subject to the provisions of section 104 of this title, be entitled to the benefit of such earlier filing date, if—

"(1) the subject matter common to the two applications, and on which he seeks a patent in the later application, was expressly disclosed, in the manner required by section 112(a) of this chapter, in the previous application; and

"(2) the subject matter of the two applications has the same inventor for the common claims thereof; and

"(3) the applicant specifically claims in the specification the benefit of the date of filing the previous application for the subject matter claimed in the second application, at the time he files the second application; and

"(4) the second application is filed prior to the earlier of—

"(A) the patenting of the previous application, or

"(B) the abandonment thereof, or

"(C) the termination of proceedings therein, or

"(D) the filing by the applicant of an appeal under section 134 of this title therein, or

"(E) one year from the public availability of the subject matter disclosed in the previous application under section 122 of this chapter (or, in the case of deferred examination of the previous application, pursuant to chapter 18 of this title, one year from the commencement of examination of the previous application).

"(b) Subject to the limitations of this section, if the previous application referred to in subsection (a) of this section is entitled to the benefit of the date of an application in a foreign country under section 119 of this chapter, with respect to the subject matter sought to be patented in the later application, then the later application referred to in subsection (a) of this section shall be entitled to the benefit of such date.

"(c) When any applicant who seeks to obtain the benefit of an earlier filing date has made any changes in the specification of the later application, with respect to the allegedly common subject matter, the burden shall be on such applicant to persuade the Office that the subject matter of such changes was expressly disclosed in the previous application. Whenever the applicant includes new matter in an application, for which he seeks the benefit provided by subsection (a) of this section, the applicant shall particularly point out

whatever new matter he adds, designated as such, in a separate portion of the specification; and such matter shall not enjoy the benefit provided by said subsection.

"§ 122. Public availability, publication, and confidential status of application

"(a) The Commissioner shall, prior to the date of first examination, in accordance with such regulations as he may prescribe, promptly index and make available for public inspection and copying all pending applications for patent, and any papers filed during the prosecution thereof, except as provided in subsection (b) of this section. Abandoned patent applications, and any papers filed during the prosecution thereof, shall be indexed and maintained available for public inspection and copying.

"(b) The Commissioner may keep such pending applications and papers (including new matter in continuing applications as designated by the applicant pursuant to section 120(c) of this chapter) secret until completion of review, if any, of the application, pursuant to section 181 of this title. No such period of secrecy shall exceed six months from the actual filing date of the application in the United States, or, in the case of new matter in a continuing application (designated as new matter by the applicant pursuant to section 120(c) of this chapter), six months from the date of filing said continuing application, unless the application has been ordered to be kept secret pursuant to section 181 of this title.

"(c) Under regulations prescribed by the Commissioner, a pending application for patent shall be published promptly after such application is made available for public inspection and copying pursuant to subsection (a) of this section. Where necessary to correct formal defects, action may be taken under sections 132 and 133 of this title to place the application in condition for publication.

"CHAPTER 12.—EXAMINATION OF APPLICATION

"Sec.

"131. Examination of application.

"132. Examination proceedings.

"133. Time for prosecuting application.

"134. Appeal to the Board of Appeals.

"135. Examination or reexamination on the basis of patents, publications, or information, cited or furnished by others.

"136. Procedures in priority of invention contest.

"137. Participation of parties.

"138. Effect of proceedings before Patent Office.

"139. Settlement agreements.

"140. Burden of persuasion.

"§ 131. Examination of application

"(a) The Commissioner shall cause an examination to be made of the application and the subject matter sought to be patented, in an examination proceeding, as specified in section 132 of this chapter. If on such examination it appears that the applicant is entitled to a patent under the law, the Commissioner shall issue a patent therefor.

"(b) The applicant shall, pursuant to such rules and within such time as the Commissioner shall prescribe, submit:

"(1) copies of or citations to those patents, publications, or other prior art or evidence of the state of the art which the applicant has considered in connection with such application for patent, the disclosure of which is necessary to make the application as a whole not misleading; and

"(2) an explanation as to why the claims in such application are patentable over such matter.

The applicant shall, if he considered no specific prior art in connection with his application, submit a statement to that effect and an explanation as to why he believes that the claims in such application are patentable. In any proceeding in which alleged fraud or misuse is predicated upon failure to comply with this subsection, the burden of proof shall be upon the party asserting such fraud or misuse.

"§ 132. Examination proceedings

"(a) The Commissioner shall provide for the assignment of applications to primary examiners, in accordance with such general system of technical

classification of patentable subject matter as the Commissioner shall establish and publish. The primary examiner shall be the presiding officer in the examination proceeding. He shall examine the specification and claims therein, or cause them to be examined in the first instance by another examiner, and shall determine whether the subject matter sought to be patented is patentable. The primary examiner may at any time request the Public Counsel to intervene and participate in any proceeding.

"(b) Whenever, in an examination proceeding, the primary examiner grants or rejects any claim of an application, makes any objection or requirement, or renders any other decision, he shall notify all parties of record. If, after service of such decision, any party of record requests reexamination, with or without amendment, the primary examiner shall reexamine the application and render a decision. The examiner may decline to reexamine the application after having once reexamined it at the instance of the party of record requesting such reexamination.

"(c) All decisions by a primary examiner shall be a written part of the record in the Office, and shall include:

"(1) findings and conclusions, and the reasons or basis therefor, on all material issues of fact, law, or discretion presented; and

"(2) an appropriate order; and

"(3) such information and references as the primary examiner may deem useful to the applicant in evaluating the desirability of continuing the prosecution of the application; and

"(4) a complete narrative report of all matters discussed in personal meetings, telephone discussions, or other communications between an examiner and an applicant, or his representatives, relating to the patent application under examination.

Statements of reasons may be long or short as the nature of the case may require.

"(d) No amendment shall introduce new matter into the disclosure of the invention. Whenever any change is made in the disclosure, the burden shall be on the applicant to persuade the Office that the matter is not new.

"(e) The applicant may present amended or new claims for reexamination of his application, but no such claims shall materially enlarge the scope of the claims of the application. Nothing contained in this subsection shall preclude any applicant from utilizing the procedures permitted by section 120 of this title.

"(f) If the subject matter sought to be patented in an application appears to relate to two or more classes of patentable subject matter, as established pursuant to subsection (a) of this section, or if the needs of administration of the Office otherwise appear so to require, the Commissioner may require examination by two or more primary examiners, for which additional examination the Commissioner may prescribe additional examination fees in accordance with section 41(a) of this title.

"§ 133. Time for prosecuting application

"Upon failure of the applicant to prosecute the application within six months after any action therein, of which notice has been given or mailed to the applicant, or within such shorter time, not less than one month, as fixed by the primary examiner in such action, the application shall be regarded as abandoned, unless it be shown to the satisfaction of the primary examiner that such delay was unavoidable.

"§ 134. Appeal to the Board of Appeals

"(a) The appeal from any final decision of the primary examiner shall be to the Board of Appeals. The Public Counsel shall be responsible for briefing and arguing the case before the Board of Appeals in respect to any appeal taken by any applicant, except in respect to priority of invention contests pursuant to section 136 of this chapter, in which case participation of the Public Counsel shall be at his discretion.

"(b) If any appeal is taken to the Board of Appeals, the primary examiner may, within such time as the Commissioner may by regulation prescribe, prepare a legal opinion elaborating and explaining the decision and statement made by him pursuant to section 132 of this chapter. The primary examiner shall not, in any appeal, otherwise appear before the Board of Appeals.

"(c) In any proceeding before the Board of Appeals, any party may introduce into the record any patents, publications, or other evidence of the state of the art not previously made part of the record; and may seek to reverse the decision of the primary examiner on the basis thereof. The Board may consider the patentability of any claim in the application, de novo, or remand any proceeding to the primary examiner for reconsideration in the light of such or other further information, including any adduced by the Board, sua sponte.

"(d) Proceedings before the Board of Appeals shall be open to the public and a transcript of any hearing shall be kept. The Board of Appeals shall render a written decision which shall be entered of record and govern further proceedings in the case. The decision of the Board shall constitute final administrative action by the Office.

"§ 135. Examination or reexamination on the basis of patents, publications, or information cited or furnished by others

"(a) Any party or other person may, after an application for patent becomes publicly available under section 122 of this title and until notice of allowance of a patent thereon, notify the Commissioner of patents, publications, other documentary or tangible evidence of the state of the art, or any other information, which may have a bearing on the patentability of any claim of said patent application, together with any explanation thereof which such person deems appropriate.

"(b) The Commissioner shall cause the claims of the patent application to be examined or reexamined by the primary examiner in the light of matter submitted pursuant to subsection (a) of this section, in such proceedings as the Commissioner shall by regulation establish. In any such proceeding, the primary examiner shall determine the patentability of the subject matter, pursuant to section 132 of this chapter.

"(c) The Commissioner shall inform the applicant of the receipt of a notice under this section, not later than one month after the receipt thereof. The applicant may present amended or new claims for such examination or reexamination, but no such claims shall enlarge the scope of the claims of the application. Failure of the applicant to prosecute in accordance with section 133 of this title shall result in the abandonment of his application. No patent shall issue until completion of the examination or reexamination of any such application.

"(d) The party, or other person, making the notification under subsection (a) of this section may participate as a party in the examination or reexamination proceeding, unless he elects not to be identified. In such case, the Patent Office shall give no information concerning the identity of such person, without his authority, unless such information is necessary to carry out the provisions of an Act of Congress or by reason of such special circumstances, as may be determined by the Commissioner to effectuate the purposes of this title.

"§ 136. Procedures in priority of invention contest

"(a) Whenever there are two or more pending applications naming different inventors and claiming the same or substantially the same subject matter, the patent shall ordinarily be issued on the application having the earliest actual filing date in the United States, if such application is otherwise allowable, and any applications having later actual filing dates in the United States with respect to such subject matter shall be rejected on the basis of such patent.

"(b) The priority of invention between or among applications subject to subsection (a) of this section shall be determined by the primary examiner in a proceeding in accordance with such rules as the Commissioner shall establish, if:

"(1) the later filed application is otherwise allowable;

"(2) the applicant therefor makes a prima facie showing of invention, as the same is defined pursuant to section 104 of this title, with respect to the date of invention stated pursuant to section 112(a) of this title; and

"(3) such applicant offers to present evidence in support of such showing, within such time as the Commissioner shall prescribe by rules, after rejection of his claims.

"(c) (1) Subject to paragraph (2) of this subsection, whenever an otherwise allowable claim of an application is for the same or substantially the same subject matter as a claim of an issued patent having an actual filing date in the United States later than that of such application, or such application discloses subject matter over which a claim of such patent is unpatentable, the primary examiner shall, on his own or any party's motion, initiate a proceeding to determine priority of invention.

"(2) No claim for the same or substantially the same subject matter as a claim of an issued patent shall be allowed unless such claim is made within one year after the date on which the patent was granted. Nothing contained in this paragraph shall, however, preclude any person from asserting the unpatentability to the patentee of the subject matter of such a claim, by reason of the prior activity of the applicant.

"(d) If two or more otherwise allowable applications claim the same or substantially the same matter and have the same actual filing date in the United States, or one or more otherwise allowable applications and an issued patent claim the same or substantially the same subject matter and have the same actual filing date in the United States, the primary examiner shall initiate a proceeding to determine priority.

"(e) Failure of the applicant to proceed under subsections (b), (c), or (d) within the time specified shall preclude such applicant from asserting priority of invention with respect to the subject matter claimed in the patent for the purpose of obtaining a patent. Failure of the patentee to proceed under subsection (c) or (d) of this section within the time specified shall operate to cancel such claim from the patent, and notice thereof shall be endorsed on copies of the specification of the patent thereafter distributed by the Patent Office.

"(f) In any proceeding under this section, the primary examiner, or any party, may raise the question of the patentability of any claim which is involved in the proceeding, and such question shall be determined in the proceeding.

"§ 137. *Participation of parties*

"Any party may at any time participate or intervene in any proceeding arising pursuant to this title, or initiate, participate, or intervene in any appeal therefrom, and thereby shall become a party of record.

"§ 138. *Effect of proceedings before Patent Office*

"(a) A final decision by the Patent Office adverse to a claim of an issued patent from which no appeal or other review has been or can be taken or had shall constitute cancellation of such claim from the patent, and notice thereof shall be endorsed on copies of the specification of the patent thereafter distributed by the Patent Office.

"(b) Except as otherwise provided in this title, no party or other person shall be foreclosed, estopped, or in any way prejudiced with respect to the assertion of any claim or any defense in any proceeding in any court by reason of his, or any other party's or other person's, having proceeded or failed to proceed in accordance with the provisions of this title. Nothing contained in this title shall be construed to supersede the jurisdiction of any Federal court or agency, nor to make any proceeding before such court or agency subject to the primary jurisdiction of the Patent Office.

"§ 139. *Settlement agreements*

"(a) Any agreement or understanding between parties to a proceeding under this chapter, including any collateral agreements referred to therein, made in connection with or in contemplation of the termination of the proceeding, shall be in writing. A copy thereof shall be filed in the Patent Office before the termination of the proceeding as between such parties. The copy shall be made part of the public record of the proceeding.

"(b) Failure to file such agreement or understanding shall render such agreement or understanding and any patent issued in connection with such proceeding permanently unenforceable.

"§ 140. *Burden of persuasion*

"In all proceedings in the Patent Office, the applicant shall have the burden of persuading the Office that a claim is patentable.

"CHAPTER 13.—REVIEW OF PATENT OFFICE DECISIONS

"Sec.

"141. Appeal to Court of Customs and Patent Appeals.

"142. Notice of appeal.

"143. Proceedings on appeal.

"144. Decision on appeal.

"145. Civil action.

"147. Appeal to the United States Court of Appeals for the District of Columbia.

"§ 141. *Appeal to Court of Customs and Patent Appeals*

"An appeal from a final decision of the Board of Appeals may be had by any party to the United States Court of Customs and Patent Appeals. Any such appeal shall be dismissed without prejudice, however, if any other party, within twenty days after the notice of appeal is filed, files notice with the Commissioner that he elects to have all further proceedings conducted as provided in section 145 of this chapter.

"§ 142. *Notice of appeal*

"When an appeal is taken to the United States Court of Customs and Patent Appeals, the appellant shall file in the Patent Office and serve upon the Public Counsel and all parties of record a written notice of appeal, within such time after the date of the decision appealed from, not less than sixty days, as the Commissioner appoints.

"§ 143. *Proceedings on appeal*

"The Commissioner shall transmit to the United States Court of Customs and Patent Appeals certified copies of the decision of the Board of Appeals and of all other necessary original papers and evidence in the case specified by the appellant or any other party. The Public Counsel shall be responsible for briefing and arguing the case before the court in respect to any appeal taken by the applicant, except in respect to priority of invention contests pursuant to section 136 of this title, in which case participation of the Public Counsel shall be at his discretion. The court shall, before hearing such appeal, give notice of the time and place of the hearing to the Commissioner, the Public Counsel, and any parties of record.

"§ 144. *Decision on appeal*

"The United States Court of Customs and Patent Appeals shall review the decision appealed from under section 141 of this title. The court may affirm or set aside the decision below, or remand the matter to the Office for further consideration in light of other factors or information that the court deems pertinent. Upon its determination the court shall return to the Commissioner a certificate of its proceedings and decision, which shall be entered of record in the Patent Office and govern further proceedings in the case.

"§ 145. *Civil action*

"Any final decision of the Board of Appeals shall be subject to judicial review by civil action against the Commissioner by any party in the United States District Court for the District of Columbia. Such action shall be commenced within such time after such decision, not less than sixty days, as the Commissioner appoints. The Public Counsel shall be responsible for briefing and arguing the case before the court in respect to any appeal taken by the applicant, except in respect to priority of invention contests pursuant to section 136 of this title, in which case participation of the Public Counsel shall be at his discretion. In any such proceeding before said district court, any party may introduce into the record any publications, patents, or other evidence of the state of the art, or other information not previously made part of the record; and may seek to reverse the decision of the Board of Appeals. The court may consider patentability, de novo, or remand any proceeding to the Patent Office for reconsideration in light of such further information. The court may affirm the decision below, set aside the rejection of any claims which were rejected in the decision of the Board of Appeals, reject the allowance of any claims previously allowed, or remand the proceeding to the Patent Office for further consideration. Such adjudication shall be entered of record in the Patent Office and govern further proceedings in the case.

"§ 147. *Appeal to the United States Court of Appeals for the District of Columbia*

"(a) Any party dissatisfied with the decision of the Court of Customs and Patent Appeals in a proceeding under section 141 of this title may seek a review thereof by the United States Court of Appeals for the District of Columbia Circuit by petition for the allowance of an appeal.

"(b) Said court of appeals may prescribe rules governing time for making such petition, the practice and procedure on such petition, the preparation of and the time for filing the transcript of the record in such cases, and generally to regulate all matters relating to appeals in such cases. If said court of appeals shall allow an appeal, the court shall review the record on appeal and shall affirm, reverse, or modify the decision in accordance with law.

"(c) No party shall file a petition for certiorari, pursuant to section 1256 of title 28, United States Code, unless he has first filed a petition pursuant to subsections (a) and (b) of this section, and it has been denied. If such a petition is granted, the provisions of sections 1252 and 1254, title 28, United States Code, shall govern any subsequent appellate review.

"CHAPTER 14.—ISSUE OF PATENT

"Sec.

"151. Issue of patent.

"152. How issued.

"153. Contents and term of patent.

"§ 151. *Issue of patent*

"(a) If it is determined that an applicant is entitled to a patent under the law, a written notice of allowance of the application shall be given or mailed to the applicant. The notice shall specify a sum, constituting the issue fee or a portion thereof, which shall be paid within three months thereafter.

"(b) Upon payment of this sum the patent shall issue, but if payment is not timely made, the application shall be regarded as abandoned.

"(c) Any remaining balance of the issue fee shall be paid within three months from the sending of a notice thereof and, if not paid, the patent shall lapse at the termination of the three-month period. In calculating the amount of a remaining balance, charges for a page or less may be disregarded.

"(d) If any payment required by this section is not timely made, but is submitted with the fee for delayed payment and sufficient cause is shown for the late payment, it may be accepted by the Commissioner as though no abandonment or lapse had ever occurred.

"§ 152. *How issued*

"Patents shall be issued in the name of the United States of America, under the seal of the Patent Office, and shall be signed by the Commissioner or have his signature placed thereon, and shall be recorded in the Patent Office.

"§ 153. *Contents and term of patent*

"(a) Every patent shall contain a grant to the applicant, his heirs or assigns, or, as provided in section 111(d) of this title, to the inventor, his heirs or assigns of the right, during the term of the patent, to exclude others, pursuant to part III of this title, from making, using, or selling the patented subject matter throughout the United States, referring to the specifications for the particulars thereof. A copy of the specification and drawings shall be annexed to the patent and be a part thereof.

"(b) The term of a patent shall expire twelve years from the actual filing date in the United States or, if a prior filing date under section 119 of this title has been claimed, twelve years from such date: *Provided, however,* That there shall be added to any such twelve-year period the period of time during which the examination of the subject matter of the application was deferred pursuant to chapter 18 of this title. Notice of the term of any patent shall be indicated at the beginning thereof.

"(c) The term of a patent whose issuance has been delayed by reason of the application having been ordered kept secret under section 181 of this title shall be extended for a period equal to such delay in issuance of the patent after the notice of allowability referred to in section 183 of this title. The term of a patent shall be extended for a period of equal to the delay incurred due to review under section 151 or 152 of the Atomic Energy Act of 1954 (68 Stat.

943). or under section 305 of the National Aeronautics and Space Act (72 Stat. 435).

"CHAPTER 15.—PLANT PATENTS

"Sec.

"161. Patents for plants.

"162. Description, claim.

"163. Grant.

"164. Assistance of Department of Agriculture.

"§ 161. *Patents for plants*

"(a) Whoever invents or discovers and asexually reproduces any distinct and new variety of plant including cultivated sports, mutants, hybrids, and newly found seedlings, other than a tuber propagated plant or a plant found in an uncultivated state, may obtain a patent therefor, subject to the conditions and requirements of this title.

"(b) The provisions of this title relating to patents for inventions shall apply to patents for plants, except as otherwise provided.

"§ 162. *Description, claim*

"No plant patent shall be declared invalid for noncompliance with section 112 of this title if the description is as complete as is reasonably possible.

"The claim in the specification shall be in formal terms to the plant shown and described.

"§ 163. *Grant*

"In the case of a plant patent the grant shall be the right to exclude others, pursuant to part III of this title, from asexually reproducing the plant or selling or using the plant so reproduced.

"§ 164. *Assistance of Department of Agriculture*

"The President may by Executive order direct the Secretary of Agriculture, in accordance with the request of the Commissioner, for the purpose of carrying into effect the provisions of this title with respect to plants (1) to furnish available information of the Department of Agriculture, (2) to conduct through the appropriate bureau or division of the Department research upon special problems, or (3) to detail to the Commissioner officers and employees of the Department.

"CHAPTER 17.—SECRECY AND FILING APPLICATIONS IN FOREIGN COUNTRIES

"Sec.

"181. Secrecy and withholding of patent.

"182. Abandonment of subject matter by reason of unauthorized disclosure.

"183. Right to compensation.

"184. Filing of application in foreign country.

"185. Patent barred for filing without license.

"186. Penalty.

"187. Nonapplicability to certain persons.

"188. Rules and regulations, delegation of power.

"§ 181. *Secrecy and withholding of patent*

"(a) Whenever publication or disclosure of the subject matter of an application for patent in which the Government has a property interest might, in the opinion of the head of an interested Government agency, be detrimental to the national security, the Commissioner upon being so notified shall order that the subject matter be kept secret and shall withhold disclosure thereof and the grant of a patent therefor under the conditions set forth hereinafter.

"(b) Whenever the publication or disclosure of subject matter described in an application for patent in which the Government does not have a property interest, might, in the opinion of the Commissioner, be detrimental to the national security, the Commissioner shall within two months of the date on which the application was filed in the United States, make the application for patent in which subject matter is disclosed available for inspection to the Atomic Energy Commission, the Secretary of Defense, and the chief officer of any other department or agency of the Government designated by the President as a defense agency of the United States.

"(c) Each individual to whom the application is disclosed shall sign a dated acknowledgment thereof, which acknowledgment shall be entered in the

file of the application. If, in the opinion of the Atomic Energy Commission, the Secretary of Defense, or the chief officer of another department or agency so designated, the publication or disclosure of such subject matter would be detrimental to the national security, the Atomic Energy Commission, the Secretary of Defense, or such other chief officer shall notify the Commissioner within five months of the date on which the application was filed in the United States. The Commissioner shall order that such subject matter be kept secret and shall withhold publication and the grant of a patent for such period as the national interest requires, and notify the applicant thereof. Upon proper showing by the head of the department or agency which caused the secrecy order to be issued that the examination of the application might jeopardize the national interest, the Commissioner shall thereupon maintain the application in a sealed condition and notify the applicant thereof. The applicant whose application has been placed under a secrecy order shall have a right to appeal from the order to the United States District Court for the District of Columbia, under such conditions and upon such proceedings as the court by its rules determines.

"(d) Subject matter described in an application shall not be ordered kept secret and publication withheld for a period of more than one year. The Commissioner shall renew the order at the end thereof, or at the end of any renewal period, for additional periods of one year upon notification by the head of the department or agency which caused the order to be issued that an affirmative determination has been made that the national interest continues so to require. An order in effect, or issued, during a time when the United States is at war, shall remain in effect for the duration of hostilities and one year following cessation of hostilities. An order in effect, or issued, during a national emergency declared by the President shall remain in effect for the duration of the national emergency and six months thereafter. The Commissioner may rescind any order upon notification by the head of the department or agency which caused the order to be issued that the publication or disclosure of such subject matter is no longer deemed detrimental to the national security.

"§ 182. Abandonment of subject matter by reason of unauthorized disclosure

"Subject matter disclosed in an application for patent subject to an order made pursuant to section 181 of this chapter shall be held abandoned upon a determination by a member of the Board of Appeals, pursuant to section 5(c) of this title, in such proceedings as the Commissioner shall by regulation establish, that in violation of said order such subject matter has been published or disclosed or that an application for a patent therefor has been filed in a foreign country by the inventor, his successors, assigns, or legal representatives, or anyone in privity with him or them, without the consent of the Commissioner. The abandonment shall be held to have occurred as of the time of violation. The consent of the Commissioner shall not be given without the concurrence of the heads of the departments and agencies which caused the order to be issued. A holding of abandonment shall abrogate all claims against the United States based upon such subject matter by the applicant, his successors, assigns, or legal representatives, or anyone in privity with him or them.

"§ 183. Right to compensation

"An applicant, or patentee, or his legal representatives, whose patent is withheld as herein provided, shall have the right, beginning at the date the applicant is notified that, except for such order, his application is otherwise in condition for allowance, and ending six years after a patent is issued thereon, to apply to the head of any department or agency who caused the order to be issued for compensation for the damage caused by the order of secrecy and/or for the use of such subject matter by the Government resulting from his disclosure. The right to compensation for use by the Government shall begin on the date of the first use of such subject matter by the Government and shall terminate not later than twenty years from the actual filing date in the United States. The head of the department or agency is authorized, upon the presentation of the claim, to enter into an agreement with the applicant, or patentee, or his legal representatives, in full settlement for the damage and/or use. This settlement agreement shall be conclusive for all purposes notwithstanding any other provision of law to the contrary. If full

settlement of the claim cannot be effected, the head of the department or agency may award and pay to such applicant, or patentee, or his legal representatives, a sum not exceeding 75 per centum of the sum which the head of the department or agency considers just compensation for the damage and/or use. A claimant may bring suit against the United States in the Court of Claims or in the district court of the United States for the district in which such claimant is a resident for an amount which when added to the award shall constitute just compensation for the damage and/or use of such subject matter, by the Government. The owner of any patent issued upon an application that was subject to a secrecy order issued pursuant to section 181 of this chapter, who did not apply for compensation as above provided, shall have the right, after the date of issuance of such patent, to bring suit in the Court of Claims for just compensation for the damage caused by reason of the order of secrecy and/or use by the Government of such subject matter resulting from his disclosure. The right to compensation for use by the Government shall begin on the date of the first use of the invention by the Government and shall terminate not later than twenty years from the actual filing date in the United States of the patent. In a suit under the provisions of this section the United States may avail itself of all defenses it may plead in an action under section 1498 of title 28. This section shall not confer a right of action on anyone or his successors, assigns, or legal representatives who, while in the full-time employment or service of the United States, discovered, invented, or developed the subject matter on which the claim is based. A patentee receiving a settlement of his claim for damages caused by reason of an order of secrecy from a head of a department or agency or who is awarded compensation for damages caused by reason of an order of secrecy by the Court of Claims shall be required to disclaim the terminal portion of the patent term equal in duration to any extension granted under the provisions of section 154(c) of this title.

"§ 184. Filing of application in foreign country

"(a) Except when authorized by a license obtained from the Commissioner, a person shall not file or cause or authorize to be filed in any foreign country an application for patent or for the registration of a utility model, industrial design or model in respect of an invention made in this country prior to six months after filing an application for patent in the United States. A license shall not be granted with respect to subject matter to an order issued by the Commissioner pursuant to section 181 of this chapter without the concurrence of the heads of the departments and agencies which caused the order to be issued.

"(b) The term 'application' when used in this chapter includes applications and any modifications, amendments, or supplements thereto, or divisions thereof.

"(c) No license shall be required subsequent to the filing of a foreign application for any modifications, amendments, or supplements to that foreign application, or divisions thereof, which do not alter the nature of the subject matter originally disclosed, which are within the scope of the subject matter originally disclosed, and where the filing of the foreign application originally complied with the provisions of this section, unless the applicant has been notified by the Commissioner that a specific license is required for filing such papers in connection with any application.

"§ 185. Patent barred for filing without license

"Notwithstanding any other provisions of law any person, and his successors, assigns, or legal representatives, shall not receive a United States patent for subject matter described in an application if that person, or his successors, assigns, or legal representatives shall, without procuring the license prescribed in section 184 of this chapter, have made, or consented to or assisted another's making, application in a foreign country for a patent or for the registration of a utility model, industrial design, or model in respect to such subject matter. A United States patent if issued for such person, his successors, assigns, or legal representatives shall be invalid.

"§ 186. Penalty

"Whoever, during the period or periods of time any subject matter has been ordered to be kept secret and the grant of a patent thereon withheld pursuant

to section 181 of this chapter, shall, with knowledge of such order and without due authorization, willfully publish or disclose or authorize or cause to be published or disclosed the subject matter or material information with respect thereto, or whoever, in violation of the provisions of section 184 of this chapter, shall file or cause or authorize to be filed in any foreign country an application for patent or for the registration of a utility model, industrial design, or model in respect of an invention made in the United States, shall, upon conviction, be fined not more than \$10,000 or imprisoned for not more than two years, or both.

"§ 187. Nonapplicability to certain persons

"The provisions and penalties of this chapter shall not apply to any officer or agent of the United States acting within the scope of his authority, nor to any person acting upon his written instructions or permission.

"§ 188. Rules and regulations, delegation of power

"The Atomic Energy Commission, the Secretary of Defense, the chief officer of any other department or agency of the Government designated by the President as a defense agency of the United States, and the Patent Office, may separately issue rules and regulations to enable the respective department or agency to carry out the provisions of this chapter, and may delegate any power conferred by this chapter.

"CHAPTER 18.—DEFERRED EXAMINATION

"Sec.

"191. Deferment of examination.

"192. Examination.

"193. Examination of related applications.

"§ 191. Deferment of examination

"(a) Notwithstanding the provisions of chapter 12 of this title, the examination of an application for patent shall be deferred unless at the time of filing the applicant requests immediate examination and pays the prescribed fee.

"(b) An application, the examination of which is deferred under the provisions of this chapter, shall be examined as to formal matters and other such matters as the Commissioner may prescribe, and action shall be taken under sections 132 and 133 of this title to place the application in condition for prompt publication pursuant to section 122 of this title. Except for a nominal fee for the examination as provided in this subsection and for a publication fee, as prescribed by the Commissioner in accordance with section 41 (a) of this title, no fees shall be charged during the period of time which the examination of such application is deferred under the provisions of this chapter.

"§ 192. Examination

"(a) If a request for examination of an application, the examination of which has been deferred under the provisions of this chapter, accompanied by payment of the required fee is made at any time before the expiration of five years from the earliest effective filing date claimed, such application shall be examined as provided in chapter 12.

"(b) Any party, or any other person, may make the request under subsection (a) of this section. If the request is made by the applicant, he shall pay the full examination fee. If the request is made by any other party or person, except the Public Counsel or the United States, that person shall pay the basic examination fee on the requested application; the applicant shall pay all other fees, including any fee for extra claims. No basic examination fee shall be charged if examination is requested by the Public Counsel or the United States, but the applicant shall pay all other fees. The identity of such other party or person (except the Public Counsel or the United States) requesting the examination shall be kept in confidence by the Patent Office and no information concerning the same given without authority of such other party or person unless necessary to carry out the provisions of any Act of Congress or in such special circumstances as may be determined by the Commissioner.

"(c) If no request for examination is received within the time specified in subsection (a) of this section, the application shall be regarded as abandoned.

"§ 193. Examination of related applications

"When examination of a deferred application is requested under section 192 of this title, the Commissioner may call upon the applicant to request examination of any other of his applications which may have been deferred and which claim the date of the first mentioned application or any application the date of which is claimed by the first mentioned application and to pay the fee. Notice shall be given the applicant of the fee due and a time of not less than thirty days shall be set for payment. If the fee is paid within the specified time, examination shall proceed on all such applications concurrently. If the fee is not paid within such time, the applications on which the required fee has not been paid shall be regarded as abandoned.

"CHAPTER 19.—AMENDMENT, CORRECTION, AND REISSUE OF PATENTS

"Sec.

"201. Reissue of defective patents.

"202. Effect of reissue.

"203. Disclaimer.

"204. Certificate of correction of Patent Office mistake.

"205. Certificate of correction of applicant's mistake.

"206. Misjoinder of inventor.

"§ 201. Reissue of defective patents

"(a) Whenever any patent is, through inadvertence, accident, or mistake, and without any willful default or intent to defraud, mislead, or deceive the public, wholly or partly inoperative or invalid, by reason of a defective specification or drawing, or by reason of the patentee claiming more than he had a right to claim in the patent, the Patent Office, pursuant to such rules and regulations as the Commissioner shall prescribe, and on the surrender of such patent and the payment of the fee required by law, shall reissue the patent for the subject matter disclosed in the original patent, and in accordance with a new and amended application, for the unexpired part of the term of the original patent. No new matter shall be introduced into the application for reissue.

"(b) The provisions of chapters 12, 13, and 14 of this title relating to applications for patent shall be applicable to applications for reissue of a patent.

"(c) No reissued patent shall be granted enlarging the scope of the claims of the original patent.

"(d) No reissue patent shall be granted during the pendency of any proceeding before any court or agency of the United States in which the validity of the patent, or the inequity of the patentee in procuring it, has been brought into question. The institution of any such proceeding shall stay the continuance of any proceeding under this section.

"§ 202. Effect of reissue

"(a) The surrender of the original patent shall take effect upon the issue of the reissued patent, and every reissued patent shall have the same effect and operation in law, on the trial of actions for causes thereafter arising, as if the same had been originally granted in such amended form, but insofar as the claims of the original and reissued patents are identical, such surrender shall not affect any action then pending nor abate any cause of action then existing, and the reissued patent, to the extent that its claims are identical or substantially identical with the original patent, shall constitute a continuation thereof and have effect continuously from the date of the original patent.

"(b) No reissued patent shall abridge or affect the right of any person or his successors in business who made, purchased, or used prior to the grant of a reissue any thing patented by the reissued patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used, unless the making, using, or selling of such thing infringes a valid claim of the reissued patent and would also have infringed the original patent. The court before which such matter is in question may provide for the continued manufacture, use, or sale of the thing made, purchased, or used as specified or for the manufacture, use, or sale of which substantial preparation was made before the grant of the reissue, and it may also provide for the continued practice of any process patented by the reissue, practiced or for the practice of which substantial preparation was made, prior to the grant of the reissue, to the extent and under such terms as the court deems equitable for the protec-

tion of investments made or business commenced before the grant of the reissue.

"§ 203. Disclaimer

"(a) Whenever, through inadvertence, accident, or mistake, and without any willful default or intent to defraud, mislead, or deceive the public, a claim of a patent is invalid the remaining claims shall not thereby be rendered invalid: *Provided*, That the patentee timely makes a disclaimer pursuant to this section, upon his learning of the defect in such claim. A patentee, whether of the whole or any interest therein, may, on payment of the fee required by law, make disclaimer of any claim, stating therein the extent of his interest in such patent. Such disclaimer shall be in writing and recorded in the Patent Office; and it shall thereafter be considered as part of the original patent to the extent of the interest possessed by the disclaimant and by those claiming under him.

"(b) In like manner any patentee or applicant may disclaim or dedicate to the public the entire term, or any terminal part of the term, of the patent granted or to be granted.

"(c) The fact that two patents which have been or may be issued expire at the same time by means of a terminal disclaimer or dedication under this section or otherwise, shall have no effect in the determination of the patentability or validity of a claim in either.

"§ 204. Certificate of correction of Patent Office mistake

"Whenever a mistake in a patent, incurred through the fault of the Patent Office, is clearly disclosed by the records of the Office, the Commissioner may issue a certificate of correction stating the fact and nature of such mistake, under seal, without charge, to be recorded in the records of patents. A printed copy thereof shall be attached to each printed copy of the patent, and such certificate shall be considered as part of the original patent. Every such patent, together with such certificate, shall have the same effect and operation in law on the trial of actions for causes thereafter arising as if the same had been originally issued in such corrected form. The Commissioner may issue a corrected patent without charge in lieu of and with like effect as a certificate of correction.

"§ 205. Certificate of correction of applicant's mistake

"Whenever a mistake of a clerical or typographical nature, or of minor character, which was not the fault of the Patent Office, appears in a patent and a showing has been made that such mistake occurred in good faith, the Patent Office may, pursuant to such rules and regulations as the Commissioner shall prescribe and upon payment of the required fee, issue a certificate of correction, if the correction does not involve such changes in the patent as would constitute new matter or would require reexamination. Such certificate shall be considered as part of the original patent, and a copy thereof may be attached to each copy of the patent. Every such patent, together with the certificate, shall have the same effect and operation in law on the trial of actions for causes thereafter arising as if the same had been originally issued in such corrected form.

"§ 206. Misjoinder of inventor

"(a) Whenever a patent is issued naming two or more persons as joint inventors and it appears that one of such persons was not in fact a joint inventor, and that he was included as a joint inventor by inadvertence, accident, or mistake, and without any willful default or intent to defraud, mislead, or deceive the public, the Patent Office may, on timely petition by all the applicants and named inventors, and assignees thereof, in such proceedings as the Commissioner shall by regulation prescribe, and with verified proof of the facts and such other requirements as may be imposed, issue a certificate deleting the name of the erroneously joined person from the patent.

"(b) Whenever a patent is issued and it appears that a person was a joint inventor, but was omitted by inadvertence, accident, or mistake, and without any willful default or intent to defraud, mislead, or deceive the public, on his part, the Patent Office may, on timely petition by all the applicants and inventors, and assignees thereof, and in such proceedings as the Commissioner shall by regulation prescribe, and with verified proof of the facts and such

other requirements as may be imposed, issue a certificate adding his name to the patent as a joint inventor.

"(c) The inadvertent, accidental, or mistaken misjoinder or nonjoinder of joint inventors, without any willful default or intent to defraud, mislead, or deceive the public, shall not invalidate a patent, if such error can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Patent Office shall issue a certificate accordingly.

"PART III—PATENTS AND INFRINGEMENT OF PATENTS

"Chapter	Sec.
"26. Ownership and assignment -----	261
"27. Government interests in patents -----	267
"28. Infringement of patents -----	271
"29. Remedies for infringement of patent, and othe actions -----	281

"CHAPTER 26.—OWNERSHIP AND ASSIGNMENT

"Sec.

"261. Ownership; assignment.

"262. Joint owners.

"263. Rights of employee-inventors guaranteed.

"§ 261. *Ownership; assignment*

"(a) Subject to the provisions of this title, patents shall have the attributes of personal property.

"(b) Applications for patent, patents, or any interest therein, shall be assignable in law by an instrument in writing.

"(c) A certificate of acknowledgment under the hand and official seal of a person authorized to administer oaths within the United States, or, in a foreign country, of a diplomatic or consular officer of the United States or an officer authorized to administer oaths whose authority is proved by a certificate of a diplomatic or consular officer of the United States, shall be prima facie evidence of the execution of an assignment, grant, or conveyance of a patent or application for patent.

"(d) An assignment, grant, or conveyance shall be void as against any subsequent purchaser or mortgagee for a valuable consideration, without notice, unless it is recorded in the Patent Office within three months from its date or prior to the date of such subsequent purchase or mortgage.

"§ 262. *Joint owners*

"In the absence of any agreement to the contrary, each of the joint owners of a patent may make, use, or sell the patented subject matter without the consent of and without accounting to the other owners.

"§ 263. *Rights of employee-inventors guaranteed*

"Subject to other provisions of Federal law, no direct or indirect assignment by an inventor to his employer, or to a person designated thereby, of the subject matter of an application for patent or patent, developed in the course of his employment, shall be valid unless the employer agrees to pay the employee, in addition to his regular salary or compensation for services, a minimum of 2 per centum of the profit or savings to the employer, attributable to such subject matter. The Commissioner shall by regulation establish procedures and methods, including accounting procedures, for carrying out the provisions of this section. No assignment, or other disposition by the employee of such right to additional payment, shall be valid, unless there is equitable and adequate consideration therefor.

"CHAPTER 27.—GOVERNMENT INTERESTS IN PATENTS

"Sec.

"267. Time for taking action in Government applications.

"§ 267. *Time for taking action in Government applications*

"Notwithstanding the provisions of sections 41, 133, and 151 of this title, the Commissioner may extend the time for taking any action to three years, when an application has become the property of the United States and the head of the appropriate department or agency of the Government has certified to the Commissioner that the subject matter disclosed therein is important to the armament or defense of the United States.

"CHAPTER 28.—INFRINGEMENT OF PATENTS

"Sec.

"271. Infringement of patent.

"272. Temporary presence in the United States.

"273. Unauthorized practice of subject matter prior to issuance of patent.

"§ 271. *Infringement of patent*

"(a) Except as otherwise provided in this title, whoever without authority makes, uses, or sells any patented subject matter within the United States after the issuance of the patent therefor and during its term, infringes the patent.

"(b) Whoever actively induces infringement of a patent shall be liable as an infringer.

"(c) Whoever sells a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the patented subject matter, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as an infringer.

"(d) No patent owner otherwise entitled to relief for infringement of a patent shall be denied relief or deemed guilty of misuse or illegal extension of the patent right by reason of his having done in good faith one or more of the following: (1) driven revenue from acts which if performed by another without his consent would constitute infringement of the patent; (2) licensed or authorized another to perform acts which if performed without his consent would constitute infringement of the patent; (3) sought to enforce the patent against infringement.

"§ 272. *Temporary presence in the United States*

"The use of any patented subject matter in any vessel, aircraft, or vehicle of any country which affords similar privileges to vessels, aircraft, or vehicles of the United States, entering the United States temporarily or accidentally, shall not constitute infringement of any patent, if such subject matter is used exclusively for the needs of the vessel, aircraft, or vehicle and is not sold in or used for the manufacture of anything to be sold in or exported from the United States.

"§ 273. *Unauthorized practice of subject matter prior to issuance of patent*

"(a) After the issuance of a patent, a patentee may obtain damages for the unauthorized making, using, or selling of the subject matter of a claim in the patent during an interim period prior to issuance of such patent, under the provisions of subsections (b) and (c) of this section and chapter 29 of this title.

"(b) Such interim period shall begin after the occurrence of all of the following events:

"(1) publication of the application containing such claim,

"(2) such claim is indicated as allowable by the Patent Office, and

"(3) actual notice to the alleged unauthorized practitioner that such claim has been indicated as allowable and how his acts are considered to constitute unauthorized practice of the subject matter of such claims, and shall end upon issuance of the patent.

"(c) Damages for unauthorized practice during the interim period shall be limited to royalties reasonable in the circumstances. No injunction or other relief may be had with respect to the subsequent use or sale of machines, manufactures, or compositions of matter made prior to the grant of the patent as to which a notice under this section applies, but reasonable royalties may be obtained. The court before which such matter is in question may provide for the continued manufacture, use, or sale of the thing made, purchased, or used as specified or for the manufacture, use, or sale of which substantial preparation was made before the grant of the patent, and it may also provide for the continued practice of any patented process, practiced or for the practice of which substantial preparation was made, prior to the grant of the patent, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced before the grant of the patent.

"CHAPTER 29.—REMEDIES FOR INFRINGEMENT OF PATENT, AND OTHER ACTIONS

"Sec.

"281. Remedy for infringement of patent.

"282. Presumption of validity; defenses.

"283. Injunction.

"284. Damages.

"285. Attorney fees.

"286. Time limitation on damages.

"287. Limitation on damages; marking and notice.

"288. Action for infringement of a patent containing an invalid claim.

"290. Notice of patent suits.

"291. Priority of invention between patentees.

"292. False marking.

"293. Nonresident patentee; service and notice.

"§ 281. *Remedy for infringement of patent*

"A patentee shall have remedy by civil action for infringement of his patent.

"§ 282. *Presumption of validity; defenses*

"(a) A patent shall be presumed valid. Each claim of a patent (whether in independent or dependent form) shall be presumed valid independently of the validity of other claims; dependent claims shall be presumed valid even though dependent upon an invalid claim. The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity.

"(b) The following shall be defenses in any action involving the validity or infringement of a patent and shall be pleaded:

"(1) Noninfringement, absence of liability for infringement, or unenforceability,

"(2) invalidity of the patent or any claim in suit on any ground specified in part II of this title as a condition for patentability,

"(3) invalidity of the patent or any claim in suit for failure to comply with any requirement of sections 112, 115, or 201 of this title,

"(4) any other act or fact made a defense by this title.

"(c) In actions involving the validity or infringement of a patent, the patentee or party asserting infringement shall give notice in the pleadings or otherwise in writing to all parties as soon as practicable and at least ninety days before the trial, of the manner in which each of the claims charged to be infringed, element by element, applies to the allegedly infringing process or product, and the elements of the structure thereof. In like manner, the party asserting invalidity or noninfringement shall at some later time give notice to all parties of the country, number, date, and name of the patentee of any patent, and the title, date, and page numbers of any publication to be relied upon as anticipation of the patent in suit, or, except in actions in the United States Court of Claims, as showing the state of the art; and the name and address of any person who may be relied upon as the prior inventor, or as having prior knowledge of, or as having previously used or offered for sale, the subject matter of the patent in suit. In addition, he shall at some still later time (at least thirty days before the trial), apply such prior art, element by element, against the claims charged to be infringed, which he alleges to be invalid. In the absence of such notice and other information, as specified in this subsection, proof of such matters may not be made at the trial except on such terms as the court may require.

"(d) In any action or proceeding involving the patentability, validity, enforceability, or infringement of a patent, whether or not arising under this title, in connection with which a court of the United States orders any party of record or any person in privity with such party to furnish discovery, testimony, or evidence, and such party or person refuses, declines, or fails to comply with such order on the ground that a foreign statute or law prohibits compliance with such order, the court shall enter an order against such party dismissing all his claims, striking all his defenses, and otherwise terminating the proceeding adversely as to him; and if an issued patent owned by such party is involved in such action or proceeding, it shall be canceled (and notice of such cancellation shall be endorsed on copies of the specification of the patent thereafter distributed by the Patent Office).

"§ 283. Injunction

"The several courts having jurisdiction of cases under this title may grant injunctions in accordance with the principles of equity to prevent the infringement of any claim of a patent, on such terms as the court deems reasonable.

"§ 284. Damages

"(a) Upon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement but in no event less than a reasonable royalty for the use made of the patented subject matter by the infringer, together with interest and cost as fixed by the court.

"(b) When the damages are not found by a jury, the court shall assess them. In either event the court may increase the damages up to three times the amount found or assessed.

"(c) The court may receive expert testimony as an aid to the determination of damages or of what royalty would be reasonable under the circumstances.

"§ 285. Attorney fees

"The court in exceptional cases may award reasonable attorney fees to the prevailing party.

"§ 286. Time limitation on damages

"(a) Except as otherwise provided by law, no recovery shall be had for any infringement committed more than two years prior to the filing of the complaint or counterclaim for infringement in the action.

"(b) In the case of claims against the United States Government for use of patented subject matter, the period before bringing suit, up to four years, between the date of receipt of a written claim for compensation by the department or agency of the Government having authority to settle such claim, and the date of mailing by the Government of a notice to the claimant that his claim has been demed shall not be counted as part of the period referred to in the preceding paragraph.

"§ 287. Limitation on damages; marking and notice

"Patentees, and persons making or selling any patented article (or using any patented process) for or under them, may give notice to the public that the article or process is patented, either by fixing on the article the word 'patent' or the abbreviation 'pat.', together with the number of the patent, or when, from the character of the article, this cannot be done, by fixing to it, or to the package wherein one or more of them is contained, a label containing a like notice. In the event of failure so to mark, no damages shall be recovered by the patents in any action for infringement, except on proof that the infringer was notified of the infringement and continued to infringe thereafter, in which event damages may be recovered only for infringement occurring after such notice. Filing of an action for infringement shall constitute such notice.

"§ 288. Action for infringement of a patent containing an invalid claim

"Whenever, through inadvertence, accident, or mistake, and without any willful default or intent to defraud, mislead, or deceive the public, a claim of a patent is invalid, an action may be maintained for the infringement of a claim of the patent which may be valid provided the requirements of section 203(a) of this title have been met.

"§ 290. Notice of patent suits

"The clerks of the courts of the United States, within one month after the filing of an action under this title shall give notice thereof in writing to the Commissioner, setting forth so far as known the names and addresses of the parties, name of the inventor, and the designating number of the patent upon which the action has been brought. If any other patent is subsequently included in the action he shall give like notice thereof. Within one month after the decision is rendered or a judgment issued the clerk of the court shall give notice thereof to the Commissioner. The Commissioner shall, on receipt of such notices, enter the same in the file of such patent.

"§ 291. Priority of invention between patentees

"(a) Whenever there are two patents naming different inventors and claiming the same or substantially the same subject matter, the owner of either of

the patents may have relief against the owner of the other by civil action, and the court may adjudge the validity of any of such patents, in whole or in part.

"(b) Such suit may be instituted against the party in interest as shown by the records of the Patent Office, but any party may become a party to the action. If there be adverse parties residing in a plurality of districts not embraced within the same State, or an adverse party residing in a foreign country, the United States District Court for the District of Columbia shall have jurisdiction and may issue summons against the adverse parties directed to the marshal of any district in which any adverse party resides. Summons against adverse parties residing in foreign countries may be served by publication or otherwise as the court directs. The Commissioner shall not be made a party but he shall be notified of the filing of the suit by the clerk of the court in which it is filed and shall have the right to intervene.

"§ 292. *False marking*

"(a) Whoever, without the consent of the patentee, marks upon, or affixes to, or uses in advertising in connection with anything made, used, or sold by him, the name or any imitation of the name of the patentee, the patent number, or the words 'patent', 'patentee', or the like, with the intent of counterfeiting or imitating the mark of the patentee, or of deceiving the public and inducing them to believe that the thing was made or sold by or with the consent of the patentee; or

"Whoever marks upon, or affixes to, or uses in advertising in connection with any unpatented article, the word 'patent' or any word or number importing that the same is patented, for the purposes or with the necessary effect of deceiving the public; or

"Whoever marks upon, or affixes to, or uses in advertising in connection with any article, the words 'patent applied for', 'patent pending', or any word importing that an application for patent has been made, when no application for patent has been made, or if made, is not pending, for the purpose or with the necessary effect of deceiving the public—

"Shall be liable for a civil penalty of not more than \$500 for every such violation. Each article so marked shall furnish the basis for finding a separate violation.

"(b) Any person may sue for the penalty, in which event one-half shall go to the person suing and the other to the use of the United States.

"§ 293. *Nonresident patentee; service and notice*

"Every patentee not residing in the United States may file in the Patent Office a written designation stating the name and address of a person residing within the United States on whom may be served process or notice of proceedings affecting the patent or rights thereunder. If the person designated cannot be found at the address given in the last designation, or if no person has been designated, the United States District Court for the District of Columbia shall have jurisdiction and summons shall be served by publication or otherwise as the court directs. The court shall have the same jurisdiction to take any action respecting the patent or rights thereunder that it would have if the patentee were personally within the jurisdiction of the court."

TRANSITIONAL AND SUPPLEMENTARY PROVISIONS

SEC. 2. Section 1542 of title 28, United States Code, Judicial Code and Judiciary, is amended to read as follows:

"§ 1542. *Patent Office decisions*

"The Court of Customs and Patent Appeals shall have jurisdiction of appeals from decisions of:

"(1) The Board of Appeals of the Patent Office as to patent applications and patents as provided in chapter 13 of title 35, Patents, United States Code.

"(2) The Commissioner of Patents or the Trademark Trial and Appeals Board as to trademark applications and proceedings as provided in section 1071 of title 15."

SEC. 3. If any provision of title 35, Patents, United States Code, as amended by this Act, or any other provision of this Act, is declared unconstitutional or is held invalid, the validity of the remaining provisions shall not be affected.

SEC. 4. (a) This Act shall take effect on the date six months after enactment. Except as otherwise provided hereafter in this section, it shall apply to all applications filed in the United States on or after such effective date, whether or not such applications are entitled to the benefit of an earlier filing date; to patents issued on such applications; to applications in respect to which, on or before such effective date, there has been no notice of allowance pursuant to section 151(a) of title 35, United States Code, as amended by this Act; and to patents issued on such applications.

(b) Except as otherwise provided hereafter in this section, the provisions of title 35, United States Code, in effect immediately prior to the effective date of this Act, shall govern all patents issued before such effective date; applications filed in the United States before and still pending on such effective date, in respect to which, on or before such effective date, there has been notice of allowance pursuant to section 151(a) of title 35, amended by this Act; and to patents issued on such applications.

(c) Section 263 of title 35, United States Code, as amended by this Act, shall apply to all applications filed on or after the effective date of this Act, and patents issued on such applications, and it shall apply only to such applications and patents.

(d) The following provisions of title 35 as amended by this Act, shall apply to all unexpired patents, whether issued or applied for before or after the effective date of this Act:

(1) chapter 19 of part II, and

(2) part III (subject to subsection (c) of this section).

(e) Section 147 of title 35, United States Code, as amended by this Act, shall apply to all appeals decided on or after the effective date of this Act.

(f) Notwithstanding any other provision of this Act, subsection (e) of section 112 of title 35 as amended by this Act shall not apply to patents issued, and applications filed, prior to the effective date of this Act. No such application shall be held incomplete, and no such patent shall be held invalid, because availability to the public of a deposit of a micro-organism recited therein was conditioned upon issuance of a United States patent reciting a deposit of said micro-organism.

(g) The amendment of title 35, United States Code, by this Act, shall not affect any rights or liabilities existing under title 35 in effect immediately prior to the effective date of this Act.

(h) Examiners-in-chief in office on the effective date of this Act shall continue in office under and in accordance with their then existing appointments.

(i) The Commissioner may exercise any rulemaking power conferred upon him by this Act, upon the date of enactment hereof: *Provided, however,* That no rule promulgated under any newly conferred authority shall become effective prior to the effective date hereof. The Public Counsel may exercise all the powers this Act confers upon him, on and after the effective date thereof, in respect to any patents, applications, or conduct, whether issued, applied for, filed, or engaged in before or after the effective date hereof.

SEC. 5. Nothing in title 35 as amended by this Act shall affect any provision of the Atomic Energy Act of 1954 (Aug. 30, 1954, ch. 1073, 68 Stat. 919) as amended or of the National Aeronautics and Space Act (Public Law 85-568, July 29, 1958; 72 Stat. 426) except that the functions of a Board of Patent Interferences specified in said Acts may be performed by the Board of Appeals as specified in section 5 of title 35 as amended by this Act.

SEC. 6. (a) Section 119(e) of this title shall take effect on the date when articles 1-2 of the Paris Convention of March 20, 1883, for the Protection of Industrial Property, as revised at Stockholm, July 14, 1967, come into force with respect to the United States and shall apply only to applications thereafter filed in the United States.

(b) Section 102(d) of this title, insofar as it applies to inventors' certificates, shall take effect six months from the date when articles 1-12 of the Paris Convention of March 20, 1883, for the Protection of Industrial Property, as revised at Stockholm, July 14, 1967, come into force with respect to the United States and shall apply to applications thereafter filed in the United States.

SEC. 7. Section 31 of the Trademark Act of 1946 (60 Stat. 427, as amended; 15 U.S.C. 1113) is revised to read:

"§ 31. *Trademark fees*

"Trademark fees shall be prescribed by the Commissioner under the authority of section 41 of title 35, United States Code. If a fee in connection with examination of a trademark application is not paid within such time as prescribed by the Commissioner, the application shall be regarded as abandoned."

SEC. 8. In the second sentence of section 7(c) of the Trademark Act of 1946 (60 Stat. 427, as amended; 15 U.S.C. 1057c), "fee herein provided" is changed to "prescribed fee".

SEC. 9. In section 7(e) of the Trademark Act of 1946 (60 Stat. 427, as amended; 15 U.S.C. 1062a), "fee herein provided" is changed to "prescribed fee".

SEC. 10. In section 12(a) of the Trademark Act of 1946 (60 Stat. 427, as amended; 15 U.S.C. 1062a), "fee herein provided" is changed to "prescribed fee".

SEC. 11. Section 5315 of title 5, United States Code, is amended by adding at the end thereof the following:

"(95) Commissioner of Patents."

SEC. 12. Section 5316 of title 5, United States Code, is amended by deleting the following:

"(48) Commissioner of Patents, Department of Commerce."

SEC. 13. Section 5316 of title 5, United States Code, is amended by adding at the end thereof the following:

"(131) Deputy Commissioner of the Patent Office."

SEC. 14. This Act may be cited as "The Patent Reform Act of 1973".

MR. BRENNAN. I again call the attention of all the witnesses to the hearing notice which indicate that this series of hearings is limited to the five issues specified in the hearing notice.

Senator McClellan, however, has indicated that the subcommittee will accept for the record written statements on any issue relevant to S. 1321. For that purpose, it is the intention of the chairman to leave the record open until September 28, and we can incorporate all the statements that are submitted for the record.

Senator HART. We can enter an order—do I understand Senator McClellan authorizes the entering of an order that any such statement filed before then will be made part of the record?

MR. BRENNAN. That is correct.

MR. Chairman, the first witness this morning is Mr. C. Marshall Dann.

MR. Dann, would you identify yourself and your associate for the record, please?

MR. DANN. I am C. Marshall Dann. I'm a patent lawyer and currently president of the American Patent Law Association on whose behalf I am testifying.

On my left is Mr. John T. Kelton, who is currently the president-elect of the American Patent Law Association.

MR. BRENNAN. Mr. Dann, I believe you have a prepared statement. Do you wish to have the statement printed in full in the record, and then you may highlight the statement?

MR. DANN. I would appreciate that happening.

Senator HART. So ordered.

[The prepared statement of Mr. Dann follows:]

STATEMENT OF C. MARSHALL DANN, PRESIDENT, AMERICAN PATENT LAW ASSOCIATION

This statement is submitted in behalf of the American Patent Law Association, an organization composed of about 3800 lawyers located throughout the United States who are concerned with the law of patents, trademarks, copyrights and unfair competition.

Many of these lawyers are members of private firms specializing in patent law; many are members of corporation patent departments. On any given occasion, some of our members are seeking to obtain or to enforce patents on inventions and others are working to avoid or to invalidate the patents granted to persons other than their clients.

Despite this wide variety of objectives with respect to specific patents, I think that essentially all of our members share the belief that the United States patent system has been a constructive feature of our political and economic scheme and that it has played an important part in stimulating the creation and introduction of new technological developments. Speaking generally, we are in favor of anything which will strengthen this system and add to its reliability and are opposed to whatever seems calculated to weaken the incentives it provides.

It is popular to blame many of the current problems of society on our advanced state of technology. This is said to be the cause of our environmental difficulties, our materialism, the effect of the automobile on our cities and so on. The fact remains that the solution of many of the most aggravated of these situations lies in the development of still more technology. We can't hope to cure the problems caused by the automobile by going back to the horse.

If our patent system is to provide effective incentives for invention and innovation, we should avoid provisions which make the whole procedure of obtaining a patent unduly expensive and burdensome to the applicant. If the mere filing of a patent application exposes the applicant to harassment, great expense, the possibility of becoming involved in litigation outside his control, and the need to divulge his invention to the world, including his competitors, before he has any sort of assurance that he will obtain patent protection, many individuals and companies will decide that the game is not worth the candle. The result would be to stifle rather than to promote the development of technology and the disclosure of new discoveries.

Valuable inventions are made both by individual inventors and by persons employed by corporations. So far as the public interest in obtaining solutions to the technical problems of the day is concerned, it is immaterial which sort of inventor solves the problem. It is therefore important that the incentives to make the necessary developments be uniformly available to all applicants.

The Board of Managers of our Association has recently given its approval to a proposed patent revision bill and we have requested the chairman of the Subcommittee to have a copy included in the record of these hearings so it will be available for your consideration. In most respects this proposed bill is similar to S. 643 of the 92nd Congress. Our committees have carefully studied the previous bill and the objections thereto which have been raised in various quarters and have redefined some of its provisions to overcome as many objections as possible. We believe our proposed bill represents a consensus on how best to revise the patent laws to achieve in the present day world the purposes which the patent system should fulfill. While there is no unanimity among our members on its provisions, we are prepared to and do support it.

Our proposed bill differs from S. 1321 with respect to every one of the five subjects to which these hearings are primarily directed. The strength of our opposition to these subjects as treated in S. 1321, however, is not the same in every case. I will discuss each proposal separately.

Incidentally, at the meeting of our Association to be held next month, on October 11 and 12, we have scheduled symposia on the subjects of oppositions, deferred examination and maintenance fees as they have actually worked in foreign countries. European and domestic patent counsel will participate. The information developed through these discussions should cast further light on whether these practices might, in some form, improve the patent system in this country.

ADVERSARY PROCEEDINGS DURING EXAMINATION

In our proposed bill, we have not provided for any opposition or reexamination prior to issue of the patent, but have included in Sections 191 and 192 provision for reexamination after issuance.

We definitely favor providing some opportunity for members of the public to come in with prior art or other information, which may demonstrate that the invention is not patentable. We agree that this should help to weed out

some undeserving patents and also to persuade the courts to give greater effect to the presumption of validity for patents which have been exposed to this procedure. Sections 191 and 192 of our proposed bill are believed to accomplish this with a minimum of chances for harassment and oppression.

Our concerns with the procedure set forth in Section 135 of S. 1321 include (a) the added expense to the Patent Office and therefore to the public of having to publish applications twice, once prior to opposition and again at time of grant; (b) exposure of the applicant to the possibility of harassment by way of extensive discovery, either by the Public Counsel or by "any party"; (c) the added expense to the applicant of a full-blown inter partes proceeding, particularly if prior to indication of patentability such as to justify such expense; and (d) the lengthy delays in issuance which could occur if a number of persons choose to intervene.

If adversary examination procedures prior to issue should be adopted, we strongly urge that the reexamination not take place until the Patent Office has indicated the application to be allowable, that the reexamination process not be repeated after issue and that the term of the patent not be shortened as a result of the time used in the reexamination proceedings. Postponing reexamination after the case has been found allowable would at least give potential opposers a better idea of the scope of claim which might issue and would avoid making the applicant publish his invention before he has some reasonable prospect of obtaining protection in return.

If provision for reexamination is included in the bill, it would seem desirable and might be specified that the reexamination would be by a different person from the examiner who handled the case initially. This should make for a greater degree of objectivity. It has been suggested that any reexamination be by the Board of Appeals.

PUBLIC COUNSEL

We readily agree that patents should not issue on unpatentable inventions, but have difficulty in seeing how creation of the office of Public Counsel can accomplish very much in this regard except at great expense. Our problem is with the practicality of the proposal rather than with the principle.

We do not see how the Public Counsel could hope to do a thorough independent job of examining selected applications unless he had a staff more or less duplicating that of the regular examining corps. Many of the duties given the Public Counsel in S. 1321 are already performed by someone else. Thus the Patent Office Solicitor and Law Examiners now represent the Patent Office in appeals and contested cases. The Commissioner regularly carries on a quality control program, though this could be considerably more effective if more funds were available.

It is not clear to us how the Public Counsel and his staff would know when to intervene in a pending application. With the subpoena power there is at least the possibility that decisions to intervene might be arbitrary, might be a form of harassment of specific applicants, and might be made for reasons other than the only legitimate one, which is to assure that only high quality patents issue. Creation of the Public Counsel might also appear to denigrate the patent examining operation and result in a lesser feeling of responsibility, lower morale and a generally lower level of effectiveness on the part of the examining corps. We tend to think that more could be obtained in improving the quality of patents by expending added monies in strengthening the examining staff and the present quality control program.

DEFERRED EXAMINATION

Provision for deferred examination has not been included in our proposed bill, though it would obviously be desirable to avoid the effort of examining those applications which, after the passage of some years, either seem unpatentable to the applicants or are of so little interest to them that examination is not requested.

There are, however distinct disadvantages. Early publication of applications, before there is any indication that they will be allowable, is unfair to the applicant and will lead to inventions being kept secret instead of being filed on.

If deferred examination is introduced, it will be necessary for the Patent Office to publish all applications subject to deferral and later to publish again

those that have become patents. Under current practice applications which do not become patents never must be published. As a result deferred examination would entail a substantial increase in printing costs for the Patent Office.

Deferred examination has an adverse effect on the users of inventions. During the period of deferral there is uncertainty whether the application will ever become patented and what subject matter will be within its ultimate claims if examination is requested. Each possible user must conduct his own examination of those applications which might affect him. Separate examinations by all potential users would be wasteful as compared with a single examination, by the Patent Office.

Most countries where deferred examination has been adopted were faced with intolerable backlogs of unexamined applications, so that it was almost a matter of necessity to adopt this procedure. The situation is quite different here where the backlog has been dropping steadily and is by no means unmanageable. We are not convinced that the advantages of deferred examination overcomes the disincentives and possibility of additional costs that accompany it.

If deferred examination should be adopted, there would be no need to publish those applications where examination is requested immediately, and it would seem desirable not to do so.

MAINTENANCE FEES

While the patent bar in this country has been historically and uniformly opposed to maintenance fees, there is currently some sentiment that such fees, if reasonable in amount and non-discriminatory, might be preferable to further increases in the filing and issue fees.

If maintenance fees should be instituted, they should not be so large as to make it prohibitive to keep in force patents which may not yet have produced any income but which have a reasonable chance of producing such income in the future. An inventor who has complied with his part of the bargain and disclosed his invention to the public should not have his right of exclusion taxed away simply to satisfy some preconception that the fewer patents in force the better. The maintenance fees called for by S. 1321 seem entirely too high and border on being confiscatory.

Even when kept reasonable in amount, maintenance fees are inherently burdensome and wasteful in that they involve record-keeping and publication expense to the Patent Office, and effort and expense to the patentee who must periodically decide whether to keep track of when fees are due.

Finally, fees, whatever their nature, should be kept administratively as simple as possible. Fees should not vary according to who owns the patent, nor should there be special exemptions.

In this connection we would urge that the matter of fees be reconsidered generally. At the hearings held by this Subcommittee in May, 1971, the American Patent Law Association submitted a report urging the following basis for fee practice:

(a) costs of examination be divided equally between the Patent Office and the applicant, since the examination process is equally of benefit to the applicant and to the public;

(b) the cost of supplying patent copies and similar services should be charged entirely to the persons receiving the services;

(c) the cost of maintaining search facilities and the Scientific Library, and the printing of patents should be funded entirely from public funds, as representing functions of benefit to the general public rather than to applicants; and

(d) the trademark operation should be entirely self-sustaining, as it is primarily for the benefit of trademark owners.

Similar recommendations were made at the same time by former Commissioner Brenner.

We continue to think that this suggested handling of fees would be fairer to applicants and to the public than trying to maintain any arbitrary overall percentage of return. If it were followed, it might well turn out to be unnecessary to look to maintenance fees to supply needed revenue.

ADMINISTRATIVE RESTRUCTURING OF PATENT OFFICE

In our proposed version of a patent law revision bill, we have retained language which would leave the Patent Office where it now is, in the Depart-

ment of Commerce. Nevertheless many of our members would be pleased to see it become an independent agency. This would give the Commissioner a degree of freedom of operation that would be desirable. On the other hand, it would deprive the Patent Office of the protection afforded by being part of a regular department of the Executive branch and could make its financial stability more precarious.

An alternative, of course, would be to make the Commissioner an Assistant Secretary of Commerce, as is provided in S. 1957 introduced June 7, 1973 by Senator McClellan. This provision was also present in S. 1254 of the previous Congress, which passed the Senate but not the House. Part of the problems of the Patent Office in the past decade or so seem to have resulted from an apparent dilution of the Commissioner's authority because of his position in the administrative structure of the Department of Commerce. This difficulty might be alleviated if he were made an Assistant Secretary.

While the topics discussed so far are those on which comments were particularly solicited, I would like to mention briefly a few of the other provisions of S. 1321 which seem undesirable to us, either because they seem burdensome or would seem to erode the protection which an inventor could obtain and would thus help to destroy the incentive which the system should provide. I will not try to discuss these in detail but would simply like to note some of them. My failure to mention any section, of course, does not necessarily indicate that we approve it.

Section 102(a) would make knowledge or use by others in a foreign country prior to the applicant's invention a bar. Section 102(b) would similarly make public use or sale in a foreign country more than a year prior to the actual U.S. filing date a bar to patentability. We believe that such foreign knowledge, use or sale is often difficult to discover and that a bona fide applicant having no knowledge of it should not be prevented thereby from obtaining a patent. It is, after all, the encouragement of the development, disclosure and use of technology in the United States that is the central purpose of our patent system.

Under Section 104(e) any description of a product could be used as a reference even though it did not teach how to make or use the product. Under this provision anyone in the chemical field could preclude patenting entire classes of compounds by publishing lists of theoretical structural formulas without ever having benefitted the public by providing it with the information needed to make the compounds available.

Section 104(e) denies patentability where the inventor has perceived a problem the solution of which is obvious. This is at least too broadly stated for it would seem to cover situations where a technical difficulty could not be solved until someone had ingeniously and unobviously discovered what was causing the difficulty. This is of benefit to the public and should be a patentable discovery even though once the cause is known it would be obvious how to remedy it.

The requirements of Section 112(a) are extremely onerous, particularly in view of the readiness of the courts to find that there has been fraud or lack of candor in connection with the supply of information to the Patent Office. It could often be very difficult for an applicant to be sure he had included in the specification "all . . . novel or unexpected properties or results and all . . . substantially superior known or obvious properties or results." Applicants should not be required to supply, in addition to a complete description of the invention, all of the know-how which has been developed with respect to the subject matter of the invention. Much of this know-how can readily be acquired by anyone who wishes to spend the time and money to develop it. Why should an applicant have to disclose it for nothing without having any assurance at all that he will obtain the desired patent protection?

Section 112(b) limits a patentee to the range of equivalents expressly set forth in the specification. This effectively denies him any range of equivalents, since if he knows all the possible ways of evading his patent, he can make his claims broad enough to include them. The doctrine of equivalents was devised to protect the patentee from persons who would copy the substance of the invention while carefully avoiding the literal language of the claims. The applicant cannot be expected to anticipate every form of evasion of this type.

Section 122 provides for the prompt publication of all applications. We believe there should be no publication in any event until the application has

been indicated as allowable, and especially no sooner than eighteen months after the filing date.

Section 153(b) would establish the term of a patent at twelve years dating from the filing date, but with the addition of any time during which the application was deferred. We would be strongly opposed to a reduction of term of this magnitude.

Section 201(c) would bar any broadened reissue patent. We are in favor of reducing the time during which a broadened reissue may be sought from the two years provided by current law to one year, but see no reason why patentees should be denied any opportunity to correct his claims to give him whatever protection his invention warrants.

Section 263 would require a minimum 2% payment from an employer to an employed inventor for assignment of an invention. The proper resolution of employer-employee rights in inventions is a complicated matter, is the subject of other proposed legislation, and should not be dealt with in a general patent revision bill without adequate hearings on this topic.

Section 286(a) would provide a two-year statute of limitations for infringement suits instead of the six years now provided. Considering the many difficulties that a patentee must overcome to enforce his patent at all, it seems unfair to whittle down his rights in this manner.

MR. DANN. Also, I have delivered to the subcommittee a copy of a proposed version of a patent revision bill which the board of managers of our association has recently given approval to, and feeling that this might be helpful in your consideration of these matters, we've asked that this be printed in the record.

Senator HART. So ordered.

[The information referred to follows:]

AMERICAN PATENT LAW ASSOCIATION

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Chapter 1—Establishment, officers, functions

Sec.

1. Establishment.
2. Seal.
3. Officers and employees.
4. Restriction on officers and employees as to interest in patents.
5. Bond of Commissioner and other officers. (Omitted)
6. Duties of Commissioner.
7. Board of Appeals.
8. Library.
9. Classification of patents.
10. Certified copies of records.
11. Publications and public services.
12. Research and studies.
13. Copies of patents for public libraries.

Section 1.—Establishment

The Patent Office shall be an Office in the Department of Commerce, where records, books, drawings, specifications, and other papers and things pertaining to patents and to trademark registrations shall be kept and preserved, except as otherwise provided by law.

Section 2.—Seal

The Patent Office shall have a seal with which letters patent, certificates of trademark registrations, and papers issued from the Office shall be authenticated.

Section 3.—Officers and employees

(a) There shall be in the Patent Office a Commissioner of Patents, a deputy commissioner, two assistant commissioners, and not more than twenty-four examiners-in-chief. The deputy commissioner, or, in the event of a vacancy in that office, the assistant commissioner senior in date of appointment, shall fill the office of Commissioner during a vacancy in that office until the Commissioner is appointed, and takes office. The Commissioner of Patents, the deputy commissioner, and the assistant commissioner shall be appointed by the President, by and with the advice and consent of the Senate. The Secretary of Commerce, upon the nomination of the Commissioner, in accordance with law, shall appoint all other officers and employees.

(b) The Secretary of Commerce may vest in himself the functions of the Patent Office and its officers and employees specified in this title and may from time to time authorize their performance by any other officer or employee.

(c) The Secretary of Commerce is authorized to fix the per annum rate of basic compensation of each examiner-in-chief in the Patent Office at not in excess of the maximum scheduled rate provided for positions in grade 17 of the General Schedule of the Classification Act of 1949, as amended.

Section 4.—Restiction on officers and employees as to interest in patents

Officers and employees of the Patent Office shall be incapable, during the period of their appointments and for one year thereafter, of applying for a patent or, during such period and for one year thereafter, being named as an inventor in an application for patent for an invention made during such period or for one year thereafter and of acquiring, directly or indirectly, except by inheritance or bequest, any patent or any right or interest in any patent, issued or to be issued by the Office. Such applications for patent thereafter shall not be entitled to any priority date earlier than one year after the termination of their appointment.

Section 5.—(Omitted.)

Section 6.—Duties of Commissioner

(a) The Commissioner, under the direction of the Secretary of Commerce, shall superintend or perform all duties required by law respecting the granting and issuing of patents and the registration of trademarks; shall have the authority to carry on studies and programs regarding domestic and international patent and trademark law; and shall have charge of property belonging to the Patent Office. He may, subject to the approval of the Secretary of Commerce, establish regulations, not inconsistent with law, for the conduct of proceedings in the Patent Office.

(b) The Commissioner, under the direction of the Secretary of Commerce, may, in coordination with the Department of State, carry on programs and studies cooperatively with foreign patent offices and international intergovernmental organizations, or may authorize such programs and studies to be carried on, in connection with the performance of duties stated in subsection (a) of this section.

(c) The Commissioner, under the direction of the Secretary of Commerce, may, with the concurrence of the Secretary of State, transfer funds appropriated to the Patent Office, not to exceed \$100,000 in any year, to the Department of State for the purpose of making special payments to international intergovernmental organizations for studies and programs for advancing international cooperation concerning patents, trademarks, and related matters. These special payments may be in addition to any other payments or contributions to the international organization and shall not be subject to any limitations imposed by law on the amounts of such other payments or contributions by the Government of the United States.

Section 7.—Board of Appeals

(a) The Commissioner, the deputy commissioner, the assistant commissioners, and the examiners-in-chief shall constitute a Board of Appeals in the Patent Office. The examiners-in-chief shall be persons of competent legal knowledge and scientific ability, who shall be appointed under the classified Civil Service.

(b) The Board of Appeals shall:

(1) Review adverse decisions of the primary examiners upon applications for patents as provided in section 134 of this title.

(2) Review or consider actions arising under chapter 18 of this title.

(3) Perform the functions specified as being performed by a Board of Patent Interferences in other Acts of Congress and when performing said function shall constitute a Board of Patent Interferences.

(c) Each appeal or other action shall be decided by at least three members of the Board of Appeals. The Board of Appeals has sole power to reconsider its decision.

(d) Whenever the Commissioner considers it necessary to maintain the work of the Board of Appeals current, he may designate any patent examiner of the primary examiner grade or higher having the requisite ability, to serve as examiner-in-chief for periods not exceeding six months each. An examiner so designated shall be qualified to act as a member of the Board of Appeals. Not more than one such designated examiner-in-chief shall be a member of the Board of Appeals hearing an appeal or considering a case. The Secretary of Commerce is authorized to fix the per annum rate of basic compensation of each designated examiner-in-chief in the Patent Office at not in excess of the maximum scheduled rate provided for positions in grade 16 of the General Schedule of positions referred to in section 5104 of title 5, United States Code. The per annum rate of basic compensation of each designated examiner-in-chief shall be adjusted, at the close of the period for which he was designated to act as examiner-in-chief, to the per annum rate of basic compensation which he would have been receiving at the close of such period if such designation had not been made.

Section 8.—Library

The Commissioner shall maintain a library of scientific and other works and periodicals, both foreign and domestic, in the patent Office to aid the officers in the discharge of their duties.

Section 9.—Classification of patents

The Commissioner may maintain with appropriate revisions the classification by subject matter of published specifications of United States patents and of such other patents and applications and other scientific and technical information as may be necessary or practicable, for the purpose of determining with readiness and accuracy the patentability of inventions for which applications for patent are filed.

Section 10.—Certified copies of records

The Commissioner may, upon payment of the prescribed fee, furnish certified copies of records of the Patent Office to persons entitled thereto.

Section 11. Publications and public services

(b) The Commissioner may cause to be published, in such format as he determines to be suitable, the following:

(1) The specifications and drawings of patents, and patent applications; subject to the provisions of this title.

(2) Certificates of trademark registrations, including statements and drawings.

(b) The Commissioner may cause to be published, in such format he he determines to be suitable, the following:

(1) Patent abstracts.

(2) The Official Gazette of the United States Patent Office.

(3) Annual indices of patents, published applications and of trademarks and information concerning the same.

(4) Annual volumes of decisions in patent and trademark cases.

(5) Classification manuals and indices of the classifications of patents.

(6) Pamphlet copies of the patent laws and rules of practice, laws, and rules relating to trademarks and circulars or other publications relating to the business of the Office.

(c) The Patent Office may print the headings of the drawings for patents for the purpose of photolithography.

(d) The Commissioner (1) shall maintain public facilities for the searching of patent materials, (2) may establish a public information service for the dissemination to the public of information concerning patents and trademarks, and (3) may from time to time disseminate or provide for dissemination of public technological and other public information, the publication of

which in his judgment would encourage invention and progress in the useful arts. Such dissemination may be made by periodical or other publications, the preparation and display of exhibits, and other appropriate means.

(e) The Commissioner may exchange copies of any of the publications specified in subsections (a) and (b) for publications desirable for the use of the Patent Office, and furnish copies of any of these publications to international intergovernmental organizations of which the United States is a member.

Section 12.—Research and studies

The Commissioner shall conduct a program of research and development to improve and expedite the handling, classification, storage, and retrieval of patents and other scientific and technical information.

Section 13.—Copies of patents for public libraries

The Commissioner may supply copies of specifications and drawings of patents to public libraries in the United States which shall maintain such copies for the use of the public, at the rate for each year's issue established for this purpose in section 41 (a) (9) of this title.

Chapter 2—Proceedings in the Patent Office

Sec.

21. Day for taking action falling on Saturday, Sunday, or holiday.
22. Form of papers filed.
23. Testimony in Patent Office cases.
24. Subpoenas, witnesses.
25. Oath and declaration in lieu of oath.
26. Effect of defective execution.
27. Effective date of documents and fees to be filed in the Patent Office.

Section 21.—Day for taking action falling on Saturday, Sunday, or holiday

When the day, or the last day, for taking any action or paying any fee falls on Saturday, Sunday, a holiday within the District of Columbia, or on any other day the Patent Office is closed, the action may be taken, or the fee paid, on the next succeeding secular or business day.

Section 22.—Form of papers filed

The Commissioner may by regulation prescribe the form of papers filed in the Patent Office.

Section 23.—Evidence in Patent Office cases

The Commissioner shall establish regulations for the presentation and production of evidence in Patent Office proceedings including affidavits, depositions, discovery and other evidence, which regulations shall provide parties with a reasonable and expeditious means of obtaining and producing evidence.

Section 24.—Subpoenas, witnesses

(a) The clerk of any United States court for the district wherein testimony is to be taken in accordance with regulations established by the Commissioner for use in any case in the Patent Office shall, upon the application of any party thereto, issue a subpoena for any witness residing or being within such district, commanding him to appear and testify before an officer in such district authorized to take testimony, depositions, and affidavits, at the time and place stated in the subpoena. The provisions of the Federal Rules of Civil Procedure relating to the attendance of witnesses, discovery and the production of documents and things shall apply to contested cases in the Patent Office insofar as consistent with Patent Office regulations established under Section 23 of this title.

(b) Every witness subpoenaed and in attendance shall be allowed the fees and traveling expenses allowed to witnesses attending the United States district courts.

(c) A judge of a court whose clerk issued a subpoena may enforce obedience to the process or punish disobedience as in other like cases, on proof that a witness, served with such subpoena, neglected or refused to appear or to testify. No witness shall be deemed guilty of contempt for disobeying such subpoena, unless his fees and traveling expenses in going to, and returning from, and one day's attendance at the place of examination, are paid or tendered him at the time of the service of the subpoena; nor for refusing to disclose any

secret matter except upon appropriate order of the court which issued the subpoena.

Section 25.—Oath and declaration in lieu of oath

(a) An oath to be filed in the Patent Office may be made before any person within the United States authorized by law to administer oaths, or, when made in a foreign country, before any diplomatic or consular officer of the United States authorized to administer oaths, or before any officer authorized to administer oaths in the foreign country in which the applicant may be, whose authority shall be proved by certificate of a diplomatic or consular officer of the United States, and such oath shall be valid if it complies with the laws of the state or country where made.

(b) The Commissioner may by regulation prescribe that any document to be filed in the Patent Office and which is required by any law or regulation to be under oath may be subscribed to by a written declaration in such form as the Commissioner may prescribe, such declaration to be in lieu of the oath otherwise required.

(c) Whenever such written declaration is used, the document must warn the declarant that willful false statements and the like are subject to punishment including fine or imprisonment, or both (18 U.S.C. 1001).

(d) The Commissioner may by regulation prescribe that any oath or declaration of a person not fluent in English shall be in a language in which he is fluent together with an English translation thereof, the accuracy of which shall be attested to pursuant to such rules as the Commissioner may prescribe.

Section 26.—Effect of defective execution

Any document to be filed in the Patent Office and which is required by any law, rule, or other regulation to be executed in a specified manner may be provisionally accepted by the Commissioner despite a defective execution provided a properly executed document is submitted within such time as may be prescribed.

Section 27.—Effective date of documents and fees to be filed in the Patent Office

The Commissioner may by regulation prescribe that an application for Letters Patent, any other document or thing, or a fee shall be deemed to have been filed in the Patent Office as of the day of deposit thereof in the United States mails and the Commissioner may by regulation prescribe the conditions which must be fulfilled to make such deposit as effective as a filing in the Patent Office as of the date of such deposit.

Chapter 3—Practice Before Patent Office

Sec.

31. Regulations for agents and attorneys. —

32. Suspension or exclusion from practice.

33. Unauthorized practice.

Section 31.—Regulations for agents and attorneys

The Commissioner may prescribe regulations governing the recognition and conduct of agents, attorneys, or other persons representing applicants or other parties before the Patent Office, and may require them, before being recognized as representatives of applicants or other persons, to show that they are of good moral character and reputation and are possessed of the necessary qualifications to render to applicants or other persons valuable service, advice, and assistance in the presentation or prosecution of their applications or other business before the Office.

Section 32.—Suspension or exclusion from practice

The Commissioner may, after notice and opportunity, for a hearing, suspend or exclude, either generally or in any particular case, from further practice before the Patent Office, any person, agent, or attorney shown to be incompetent or disreputable, or guilty of gross misconduct, or who does not comply with the regulations established under section 31 of this chapter, or who shall, by word, circular, letter, or advertising, with intent to defraud in any manner, deceive, mislead, or threaten any applicant or prospective applicant, or other person having immediate or prospective business before the

Office. The reasons for any such suspension or exclusion shall be duly recorded. The United States District Court for the District of Columbia, under such conditions and upon such proceedings as it by its rules determines, may review the action of the Commissioner upon the petition of the person so suspended or excluded, or refused recognition under section 31 of this title.

Section 33.—Unauthorized practice

(a) Whoever, not being recognized to practice before the Patent Office—
 (1) holds himself out or knowingly permits himself to be held out as so recognized, or

(2) holds himself out or knowingly permits himself to be held out as available either to perform the service of preparing or prosecuting an application for patent or to provide such service to be performed by a person not so recognized or by an unidentified person, or

(3) for compensation, either performs the service of preparing or prosecuting an application for patent for another not so recognized or provides such service to be performed by a person not so recognized or by an unidentified person,

shall be punished by imprisonment not exceeding one year, or a fine not exceeding \$1,000 for each offense, or both.

(b) Where an agent, attorney, or firm recognized to practice before the Patent Office, assumes responsibility for the service of preparing or prosecuting a patent application at the time such service is rendered, the service shall be considered as performed by such agent, attorney, or firm within the meaning of this section.

Chapter 4—Patent Fees

Sec.

41. Patent fees.

42. Payment of patent fees; return of excess amounts.

Section 41.—Patent fees

(a) The Commissioner shall charge the following fees:

1. On filing each application for an original patent, except in design cases, \$65; in addition, on filing or on presentation at any other time, \$10 for each claim in independent form which is in excess of one, and \$2 for each claim whether independent or dependent, which is in excess of ten. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

2. For issuing each original or reissue patent, except in design cases, \$100; in addition, \$10 for each page (or portion thereof) of specification as printed, and \$2 for each sheet of drawing.

3. In design cases:

a. On filing each design application, \$20.

b. On issuing each design patent: For three years and six months, \$10; for seven years \$20; and for fourteen years \$30.

4. On filing each application for the reissue of a patent, \$65; in addition, on filing or on presentation at any other time, \$10 for each claim in independent form which is in excess of the number of independent claims of the original patent, and \$2 for each claim (whether independent or dependent) which is in excess of ten and also in excess of the number of claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

5. On filing each disclaimer, \$15.

6. On appeal for the first time from the examiner to the Board of Appeals, \$50; in addition, on filing a brief in support of the appeal, \$50.

7. On filing each petition for the revival of an abandoned application for a patent or for the delayed payment of the fee for issuing each patent, \$15.

8. For certificate under section 255 or under section 256 of this title, \$15.

9. As available and if in print: For uncertified printed copies of specifications and drawings of patents (except design patents), 50 cents per copy; for design patents, 20 cents per copy; the Commissioner may establish a charge not to exceed \$1 per copy for patents in excess of twenty-five pages of drawings and specifications and for plant patents printed in color: special rates for libraries specified in section 13 of this title, \$50 for patents issued in one year. The Commissioner may, without charge, provide applicants with copies of specifications and drawings of patents when referred to in a notice under section 132.

10. For recording every assignment, agreement, or other paper relating to the property in a patent or application, \$20; where the document relates to more than one patent or application, \$3 for each additional item.

11. For each certificate, \$1.

(b) The Commissioner may establish charges for copies of records, publications, or services furnished by the Patent Office, not specified above.

(c) The fees prescribed by or under this section shall apply to any other Government department or agency, or officer thereof, except that the Commissioner may waive the payment of any fee for services or materials in cases of occasional or incidental requests by a Government department or agency, or officer thereof.

Section 42.—Payment of patent fees; return of excess amounts

All patent fees shall be paid to the Commissioner who shall deposit the same in the Treasury of the United States in such manner as the Secretary directs, and the Commissioner may refund any sum paid by mistake or in excess of the fee required by law.

PART II—PATENTABILITY OF INVENTIONS AND GRANT OF PATENTS

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Chapter 10—Patentability of inventions

Sec.

100. Definitions.

101. Inventions patentable.

102. Conditions for patentability; novelty and loss of right to patent.

103. Conditions for patentability; non-obvious subject matter.

104. Invention made abroad.

Section 100.—Definitions

When used in this title unless the context otherwise indicates—

(a) The term "invention" means invention or discovery.

(b) The term "process" means process, art or method and includes a new use of a known process, machine, manufacture, composition of matter, or material.

(c) The terms "United States" and "this country" mean the United States of America, its territories and possessions, and the Commonwealth of Puerto Rico.

(d) The term "applicant" means any person who owns an application for a patent, as provided in this title.

(e) The term "patentee" includes not only the person to whom the patent was issued but also the successors in title to such person.

(f) The term "actual filing date in the United States" includes the filing date to which an application or patent, or the subject matter of any claim thereof, may be entitled under the provisions of section 120 of this title (and excludes any date under section 119 of this title). An application or the resulting patent may contain separate claims for subject matter having different filing dates in the United States by virtue of the provisions of section 120 of this title or may contain claims entitled to the benefit of a prior date under the provisions of section 119 of this title, in addition to claims not so entitled.

(g) The term "useful" shall include, but shall not be limited to, utility in agriculture, commerce, industry, health or research.

Section 101.—Inventions patentable

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, or his successor in title, may obtain a patent therefor, subject to the conditions and requirements of this title.

Section 102.—Conditions for patentability; novelty and loss of right to patent

An applicant shall be entitled to a patent unless:

(a) The invention or any of his predecessors in title has abandoned the invention; or

(b) The invention was first patented or caused to be patented or was the subject of an inventor's certificate by the inventor or applicant, or their assigns or legal representatives, or described or caused to be described in the official publication of the application in a foreign country before the actual filing date in the United States of the application, on an application for patent or inventor's certificate filed more than twelve months before such actual filing date in the United States; or

(c) Before the invention thereof the invention was made in this country by another, provided the invention of such other does not stand abandoned at the time of the invention which is the subject of the application; and further provided that such other has not suppressed or concealed his invention. In determining priority of invention, there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time before conception by the other until his own reduction to practice. However, in establishing priority of invention, an invention which has been abandoned shall not be accorded a date prior to the date of resumption of activity.

(d) The subject matter was not invented by the inventor himself but rather derived by him from another.

(e) The invention is identically disclosed or described in any of the following prior art:

(1) A patent or publication in this or a foreign country reasonably available to the public of the United States in printed or other tangible form before the invention was made by the inventor, or more than one year before the actual filing date in the United States of the application; or

(2) A published United States patent application or United States patent of another which has an actual filing date in the United States before the invention was made by the inventor named in the application; or

(3) Subject matter made known publicly by another to persons in the art or arts to which it pertains, or in public use by another, in this country before the invention was made by the inventor named in the application; or

(4) Subject matter on sale or in public use in this country more than one year before the actual filing date in the United States of the application; or

(5) With respect only to the losing party of a priority of invention contest under sections 193 and 291 of this title, the subject matter of the claim involved.

Section 103.—Conditions for patentability; nonobvious subject matter

A patent may not be obtained though the invention is not identically disclosed or described in the prior art as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and such prior art are such that the subject matter as a whole would have been obvious from such prior art at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made, nor because the invention has simplicity or is the last step in an evolutionary development, nor because it is not revolutionary, basic, scientific or technical in character. Claims for a new combination or assemblage of known mechanical or other elements shall be subjected to the same standard of patentability as is applied to claims for other types of subject matter.

Section 104.—Invention made abroad

In proceedings in the Patent Office and in the courts, an applicant for a patent, or a patentee, may not establish a date of invention by reference to knowledge or use thereof, or other activity with respect thereto, in a foreign country, except as provided in section 119 of this title. Where an invention was made by a person, civil or military, while domiciled in the

United States and serving in a foreign country in connection with operations by or on behalf of the United States, he shall be entitled to the same rights of priority with respect to such invention as if the same had been made in the United States.

Chapter 11—Application for patent

Sec.

- 111. Application for patent.
- 112. Specification.
- 113. Drawings.
- 114. Models, Specimen.
- 115. Oath of applicant.
- 116. Joint inventors.
- 117. Death or incapacity of inventor.
- 119. Benefit of earlier filing date in foreign country; right of priority.
- 120. Benefit of earlier filing date in the United States.
- 121. Divisional applications.
- 122. Confidential status of applications.
- 123. Publication.

Section 111.—Application for patent

(a) An application for patent may be filed by either the inventor or the owner of the invention sought to be patented. The application shall be made in writing to the Commissioner, shall be signed by the applicant and include the name of each person believed to have made an inventive contribution, and shall be accompanied by the prescribed fee. An application filed by a person not the inventor shall include, at the time of filing, a statement of the facts supporting the allegation of ownership of the invention.

(b) An application for patent shall include—

- (1) a specification as prescribed by section 112 of this chapter; and
- (2) a drawing as prescribed by section 113 of this chapter.

(c) For purposes of filing a patent application and securing a filing date, an application may be signed by an agent of the applicant provided that the agent is authorized so to do or provided that the application is ratified in writing by the applicant within six months after filing. Failure of proof of the authority of the agent or of ratification by the applicant within six months after the filing of the application shall result in abandonment of the application.

(d) When the application is signed by the owner or his agent, the owner, within thirty days after filing an application for patent, shall serve a copy of the application on the inventor along with a statement calling the inventor's attention to the provisions of subsection (e) of this section. Service may be effected by mailing a copy of the application and statement, by first-class mail, to the last known address of the inventor. Failure to serve a copy of the application and statement on the inventor within thirty days shall result in abandonment of the application. The Commissioner may by regulation require proof of such service, and may extend the thirty day period or waive the requirement for service upon a showing of sufficient cause.

(e) An inventor, within a time prescribed by the Commissioner, may furnish a statement under oath to the Commissioner alleging that the applicant is not the owner of the invention as required by subsection (a) of this section. The Commissioner, in accordance with such regulations as he establishes and on compliance with the requirements of this title, shall issue a patent to the inventor filing such statement without prejudice to later judicial proceedings, unless the notice is withdrawn by the inventor or the applicant records in the Patent Office an assignment by the inventor, or in lieu thereof, files a written statement by the inventor consenting to the filing of the application by and the issuance of the patent to the applicant.

(f) Notice to the Commissioner, in a manner prescribed by regulations, of a final decision in a judicial proceeding in a court having jurisdiction thereof, from which no appeal has or can be taken, that an applicant is the owner of an invention shall authorize the Commissioner to issue a patent to such applicant for such invention.

(g) An error in the naming of an inventor, in either a sole or joint application for patent, without deceptive intent, may be corrected at any time, in accordance with regulations established by the Commissioner.

Section 112.—Specification

(a) The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it patterns, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the applicant of carrying out the invention.

(b) The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter regarded as the invention. A claim may be written in independent or dependent form, and if in dependent form, it shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim.

(c) An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

(d) When the invention relates to a process involving the action of a microorganism not already known and available to the public or to a product of such a process, the written description required by subsection (a) of this section shall be sufficient as to said microorganism if—

(1) not later than the date that the United States application is filed, an approved deposit of a culture of the microorganism is made by or on behalf of the applicant or his predecessor in title, and

(2) the written description includes the name of the depository and its designation of the approved deposit and, taken as a whole, is in such descriptive terms as to enable any person skilled in the art to which the invention pertains to make and use the same.

An approved deposit shall be a deposit which—

(1) is made in any public depository in the United States which shall have been designated for such deposits by the Commissioner of Patents by publication, and

(2) is available, except as otherwise prohibited by law, in accordance with such regulations as may be prescribed,

(a) to the public issuance of a United States patent to the applicant or his predecessor or successor in title which refers to such deposit, and

(b) prior to issuance of said patent, under the conditions specified in section 122.

(e) For the dissemination of information and other purposes, the Commissioner, in accordance with such regulations as he establishes, may require a brief abstract of all or part of the application. The abstract shall not be used for interpreting the scope of any claims of a patent, nor shall it affect in any way the validity of the patent.

Section 113.—Drawings

When the nature of the case admits, the applicant shall furnish a drawing.

Section 114.—Models, specimens

(a) The Commissioner may require the applicant to furnish a model of convenient size to exhibit advantageously the several parts of his invention.

(b) When the invention relates to a composition of matter, the Commissioner may require the applicant to furnish specimens of ingredients for the purpose of inspection or experiment.

Section 115.—Oath of applicant

(a) The inventor shall make oath that he believes to the best of his knowledge that he is the first inventor, that he is aware of no prior public use or other facts which would bar the issuance of the patent, and that he has made full disclosure to the Patent Office of all facts he reasonably believes to be pertinent to the prosecution of his application: such oath shall state of what country the inventor is a citizen.

(b) The applicant of an application filed pursuant to Section 117 of this title may make the oath required by subsection (a) of this section, so varied in form that it can be made by him.

(c) The oath or oaths shall be submitted not later than the time of payment of the fee required under the provisions of Section 151 (a) of this title.

Section 116.—Joint inventors

(a) When two or more persons have made inventive contributions to subject matter claimed in an application, they shall apply for a patent jointly and each sign the application and make the required oath, or, if the application is filed by some other person having the right to do so, they shall be named as the inventors.

(b) In an application for patent for an invention naming two or more inventors, it shall not be necessary for each person named as an inventor to be a joint inventor of the invention asserted in any claim.

(c) If a joint inventor refuses to join another inventor in an application for patent, or cannot be found or reached after diligent effort, the application may, subject to the requirements of section 111 of this title, be made by the other inventor on behalf of himself and the omitted inventor. The Commissioner, on proof of the pertinent facts and after such notice to the omitted inventor as he prescribes, may grant a patent to the inventor making the application, subject to the same rights which the omitted inventor would have had if he had been joined. The omitted inventor may subsequently join in the application.

Section 117.—Death or incapacity of inventor

Legal representatives of deceased inventors and of those under legal incapacity may make application for patent and otherwise proceed on behalf of the inventor upon compliance with the requirements and on the same terms and conditions applicable to the inventor.

Section 118.—Oath by other than the inventor

Whenever an inventor refuses to execute an oath, or cannot be found or reached after diligent effort, a person to whom the inventor has assigned or agreed in writing to assign the invention or who otherwise shows sufficient proprietary interest in the matter justifying such action, may make oath on behalf of and as agent for the inventor on proof of the pertinent facts and a showing that such action is necessary to preserve the rights of the parties or to prevent irreparable damage; and the Commissioner may grant a patent to the applicant upon such notice to the inventor as the Commissioner deems sufficient, and on compliance with such regulations as he prescribes.

Section 119.—Benefit of earlier filing date in foreign country; right of priority

(a) An application for patent for an invention filed in this country by any person who has, or whose predecessor or successor in title has, previously regularly filed an application for a patent for the same invention in a foreign country which affords similar privileges in the case of applications filed in the United States or to citizens of the United States, shall have the same effect as the same application would have if filed in the United States on the date on which the application for patent for the same invention was first filed in any such foreign country, if the application in this country is filed within twelve months from the earliest date on which such foreign application was filed.

(b) To obtain the benefit of the right of priority under this section the applicant shall make a claim therefor at the time the application is filed unless it be shown to the satisfaction of the Commissioner that there was a sufficient cause for failure to do so, and shall file a certified copy of the original foreign application, specification, and drawings on which it is based, at such time during the pendency of the application as required by the Commissioner not earlier than six months after the filing of the application in this country. The Commissioner may require a translation of the papers filed if not in the English language and such other information as he deems necessary.

(c) In like manner and subject to the same conditions and requirements, the right provided in this section may be based upon a subsequent regularly filed application in the same foreign country instead of the first filed foreign application, provided that any foreign application filed prior to such subsequent application has been withdrawn, abandoned, or otherwise dis-

posed of without having been laid open to public inspection and without leaving any rights outstanding, and has not served, nor thereafter shall serve, as a basis for claiming a right of priority.

(d) When the application claiming priority under this section, discloses an invention relating to a process involving the action of a microorganism not already known and available to the public or to a product of such a process and an approved deposit is made under section 112, subsection (d), the approved deposit shall be considered to have been made on the earliest date that an application in a foreign country, the priority of which is being claimed, contains a reference identifying a deposit of the same microorganism made in a public depository.

(e) Applications for inventors' certificates filed in a foreign country in which applicants have a right to apply, at their discretion, either for a patent or for an inventor's certificate shall be treated in this country in the same manner and have the same effect for purpose of the right of priority under this section as applications for patent, subject to the same conditions and requirements of this section as apply to applications for patent, provided such applicants are entitled to the benefits of the Stockholm Revision of the Paris Convention at the time of such filing.

Section 120.—Benefit of earlier filing date in the United States

(a) An application for patent for an invention disclosed in the manner provided in section 112 (a) of this chapter in an application previously filed in the United States shall have the same effect, as to such invention, as though filed on the date of the prior application if—

(1) it is filed during the pendency of the prior application, that is before the patenting or abandonment of, or the termination of proceedings in, the prior application,

(2) The two applications have the same inventor for the subject matter, common to both, and

(3) the application specifically claims or is amended to claim the benefit of the date of filing of the prior application for subject matter claimed in the second application.

(b) In a series of applications with respect to an invention, each of which is entitled to the benefit of the filing date of the immediately preceding application in the series in accordance with the provisions of subsection (a) of this section, the last application in the series shall be entitled to the benefit of the filing date of the earliest application in the series for which a claim is made, even though any application in the series may be copending only with the immediately preceding application.

(c) An applicant must claim the benefit of the filing date of the earliest application on which he intends to rely in a later filed application within three months of the time of filing such later application, or during examination or reexamination of such application as provided in chapter 12 of this title upon an adequate showing why the claim was not made earlier. In a series, each application must claim the benefit of the immediately preceding application in accordance with the provisions herein.

(d) The Commissioner may by regulation dispense with signing and execution in the case of an application directed solely to subject matter described and claimed in the prior application.

Section 121.—Divisional applications

(a) If two or more independent and distinct inventions are claimed in one application, the Commissioner may require the application to be restricted to one of them. The Commissioner shall not require the further restriction of any application previously restricted under the provisions of this section, or of any application filed as a result of a requirement for restriction under this section, unless such subsequent requirement arises as a result of changes in the claimed subject matter.

(b) The validity of a patent may not be questioned for failure of the Commissioner to require the application to be restricted under subsection (a) of this section, nor may the validity of either of two or more patents resulting from and in accordance with a requirement, whether proper or not, under said subsection (a) be questioned solely because of the existence of several patents, if the subsequent application is filed in accordance with the provisions of section 120 of this chapter.

Section 122.—Confidential status of applications

Applications for patents shall be kept in confidence by the Patent Office and no information concerning the same given without authority of the applicant, or the owner of record of the application, except in such special circumstances as may be determined by the Commissioner.

Section 123.Publication

The Commissioner may establish regulations for the publication of pending applications at the request of applicants and shall publish applications in accordance therewith.

Chapter 12—Examination of application

Sec.

131. Examination of application.

132. Notice of rejection; reexamination.

133. Time for prosecuting application.

134. Appeal to the Board of Appeals.

Section 131.—Examination of application

(a) The Commissioner shall cause an examination to be made of the application and the alleged new invention; and if on such examination it is determined that the applicant is entitled to a patent under the law, the Commissioner shall issue a patent therefor as hereinafter provided.

(b) The Commissioner may require applicants, within such time as he may prescribe by regulation, to submit copies of or cite, a reasonable number of patents and publications the applicant has specifically considered in connection with his application for patent, and which were known with reasonable certainty to be prior art or, if not specific relevant patents or publications were considered a statement to that effect and an explanation as to why the claims in such application are believed to be patentable. Neither matters of judgment exercised in citing such patents or publications nor inadvertent failure to comply with the provisions of this section in whole or in part shall constitute a ground for holding a patent invalid or unenforceable, or subject the patentee or his attorney or agent to a charge of misuse or fraud.

(c) The granting of a patent shall not be refused solely on the ground that if it occurred there would then exist more than one patent for the same invention where the patents will expire on the same date as a result of filing on the same date or as the result of a terminal disclaimer pursuant to section 253 of this title so long as the right to sue for infringement of said patents is in the same legal entity.

Section 132.—Notice of rejection; reexamination

Whenever, on examination, any claim of an application is rejected, or any objection or requirement made, the Commissioner shall notify the applicant thereof, stating the reasons therefor, together with such information and references as may be useful in judging the propriety of continuing the prosecution of the application; and if after receiving such notice, the applicant requests reexamination, with or without amendment, the application shall be reexamined. No amendment shall introduce new matter into the disclosure of the invention.

Section 133.—Time for prosecuting application

Upon failure of the applicant to prosecute the application within six months after any action therein, of which notice has been given or mailed to the applicant, or within such shorter time, not less than one month, as fixed by the Commissioner in such action, the application shall be regarded as abandoned by the parties thereto, unless it be shown to the satisfaction of the Commissioner that such delay was unavoidable.

Section 134.—Appeal to the Board of Appeals

An applicant for a patent, any of whose claims has been finally or twice rejected, may appeal from the decision of the primary examiner to the Board of Appeals, having once paid the fee for such appeal.

Chapter 13—Review of patent office decisions

Sec.

- 141. Appeal to Court of Customs and Patent Appeals.
- 142. Notice of appeal.
- 143. Proceedings on appeal.
- 144. Decision on appeal.
- 145. Civil action to obtain patent.
- 146. Civil action in case of interference.
- 148. Presumption of correctness.

Section 141.—Appeal to Court of Customs and Patent Appeals

(a) An applicant, or patentee, dissatisfied with the decision of the Board of Appeals under section 134 or 191 of this title may appeal to the United States Court of Customs and Patent Appeals thereby waiving his right to proceed under section 145 of this chapter.

(b) A party to a proceeding under section 192 of this title dissatisfied with the decision of the Board of Appeals may appeal to the United States Court of Customs and Patent Appeals.

(c) A party to a priority of invention contest under section 193 of this title dissatisfied with the decision of the Board of Appeals on the question of priority may appeal to the United States Court of Customs and Patent Appeals, but such appeal shall be dismissed if any adverse party to such priority of invention contest, within twenty days after the appellant has filed notice of appeal according to section 142 of this title, files notice with the Commissioner that he elects to have all further proceedings conducted as provided in section 146 of this title. Thereupon the appellant shall have thirty days thereafter within which to file a civil action under section 146, in default of which the decision appealed from shall govern the further proceedings in the case.

Section 142.—Notice of appeal

When an appeal is taken to the United States Court of Customs and Patent Appeals, the appellant shall file in the Patent Office a written notice of appeal directed to the Commissioner, within such time after the date of the decision appealed from, not less than sixty days, as the Commissioner appoints.

Section 143.—Proceedings on appeal

The Commissioner shall transmit to the United States Court of Customs and Patent Appeals certified copies of all the necessary papers and evidence in the case designated by the appellant and any additional such papers and evidence designated by the Commissioner or another party. The Commissioner in an ex parte case may appear in court by his representative and present the position of the Patent Office. The court shall, before hearing an appeal, give notice of the time and place of the hearing to the Commissioner and the parties thereto.

Section 144.—Decision on appeal

The United States Court of Customs and Patent Appeals shall review the decision appealed from on the evidence produced before the Patent Office and transmitted to the court under the provisions of section 143 of this chapter. Upon its determination the court shall return to the Commissioner a certificate of its proceedings and decision, which shall be entered of record in the Patent Office and govern the further proceedings in the case.

Section 145.—Civil action to obtain patent

An applicant, or a patentee, if dissatisfied with the decision of the Board of Appeals under section 134 or 191 of this title may, unless appeal has been taken to the United States Court of Customs and Patent Appeals, have remedy by civil action against the Commissioner in the United States District Court for the District of Columbia. Such action shall be commenced within such time after such decision, not less than sixty days, as the Commissioner appoints. The court may, in the case of review of a decision refusing a patent or any claim, adjudge that such applicant is entitled to receive a patent for his invention, as specified in any of his claims involved

in the decision of the Board of Appeals, as the facts in the case may appear and such adjudication shall authorize the Commissioner to issue such patent on compliance with the requirements of law. All the expenses of the proceeding under this section shall be paid by the applicant.

Section 146.—Civil action in case of interference

Any party to a priority of invention contest under section 193 of this title dissatisfied with the decision of the Board of Appeals on the question of priority, may have remedy by civil action, if commenced within such time after such decision, not less than sixty days, as the Commissioner appoints or as provided in section 141 of this title, unless he has appealed to the United States Court of Customs and Patent Appeals, and such appeal is pending or has been decided. In such suits the record in the Patent Office shall be admitted on motion of either party upon the terms and conditions as to costs, expenses, and the further cross-examination of the witnesses as the court imposes, without prejudice to the right of the parties to take further testimony. The testimony and exhibits of the record in the Patent Office when admitted shall have the same effect as if originally taken and produced in the suit.

Such suit may be instituted against the party in interest as shown by the records of the Patent Office at the time of the decision complained of, but any party in interest may become a party to the action. If there be adverse parties residing in a plurality of districts not embraced within the same state, or an adverse party residing in a foreign country, the United States District Court for the District of Columbia shall have jurisdiction and may issue summons against the adverse parties directed to the marshal of any district in which any adverse party resides. Summons against adverse parties residing in foreign countries may be served by publication or otherwise as the court directs. The Commissioner shall not be a necessary party but he shall be notified of the filing of the suit by the clerk of the court in which it is filed and shall have the right to intervene. Judgment of the court in favor of the right of an applicant to a patent shall authorize the Commissioner to issue such patent on the filing in the Patent Office of a certified copy of the judgment and on compliance with the requirements of law.

Section 148.—Presumption of correctness

In any appeal or proceeding under this chapter, the Patent Office decision shall be given a presumption of correctness.

Chapter 14—Issue of patent

Sec.

- 151. Issue of Patent.
- 153. How Issued.
- 154. Contents and term of patent.
- 155. Patents granted on review.

Section 151.—Issue of patent

(a) If it is determined that an applicant is entitled to a patent under the law, a written notice of allowance of the application shall be given or mailed to the applicant. The notice shall specify a sum, constituting the issue fee or a portion thereof, which shall be paid within three months thereafter.

(b) Upon payment of this sum the patent shall issue, but if payment is not timely made, the application shall be regarded as abandoned.

(c) Any remaining balance of the issue fee shall be paid within three months from the sending of a notice thereof and, if not paid, the patent shall lapse at the termination of the three-month period. In calculating the amount of a remaining balance, charges for a page or less may be disregarded.

(d) If any payment required by this section is not timely made, but is submitted with the fee for delayed payment, together with a showing of sufficient cause for the late payment, it may be accepted by the Commissioner as though no abandonment or lapse had ever occurred.

Section 153.—How issued

Patents shall be issued in the name of the United States of America, under the seal of the Patent Office, and shall be signed by the Commissioner or have his signature placed thereon, and shall be recorded in the Patent Office.

Section 154.—Contents and term of patent

(a) Every patent shall contain a grant to the applicant, his heirs or assigns, or, as provided in section 111 (e) of this title, to the inventor, his heirs or assigns of the right, during the term of the patent to exclude others from making, using, or selling the invention throughout the United States, referring to the specification for the particulars thereof. A copy of the specification and drawings shall be annexed to the patent and be a part thereof.

(b) The term of a patent shall expire twenty years from the date of filing the application in the United States or, if the benefit of the filing date in the United States of a prior application is claimed, from the earliest such prior date claimed. In determining the term of the patent, the date of filing any application in a foreign country which may be claimed by the applicant shall not be taken into consideration.

(c) The term of a patent whose issuance has been delayed by reason of the application having been ordered kept secret under section 181 of this title shall be extended for a period equal to such delay in issuance of the patent after the notice of allowability referred to in section 183 of this title. The term of a patent shall also be extended for a period equal to the delay incurred due to review under sections 151 or 152 of the Atomic Energy Act of 1954 (68 Stat. 943), or under section 305 of the National Aeronautics and Space Act (72 Stat. 435).

Section 155.—Patents granted on review

An applicant for patent may, after initiating review under sections 141, 145 or 146 of this title, request the issuance of a patent for claims standing allowed in the application. Upon payment of the prescribed fee, issuance of such patent shall occur in accordance with this chapter. As to claims which stand allowed, the patent shall have the force and effect specified in section 154 of this chapter. Each claim in the application not standing allowed shall be identified as such, and shall not have any force and effect, except as provided in section 257 of this title.

Chapter 15—Plant Patents

Sec.

161. Patents for plants.

162. Description, claim.

163. Grant.

164. Assistance of Department of Agriculture.

Section 161.—Patents for plants

(a) Whoever invents or discovers and asexually reproduces any distinct and new variety of plant, including cultivated sports, mutants, hybrids, and newly found seedlings, other than a tuber propagated plant or a plant found in an uncultivated state, may obtain a patent therefor, subject to the conditions and requirements of this title. (Amended September 3, 1954, 68 Stat. 1190)

(b) The provisions of this title relating to patents for inventions shall apply to patents for plants, except as otherwise provided.

Section 162.—Description, claim

No plant patent shall be declared invalid for noncompliance with section 112 of this title if the description is as complete as is reasonably possible.

The claim in the specification shall be in formal terms to the plant shown and described.

Section 163.—Grant

In the case of a plant patent the grant shall be of the right to exclude others from asexually reproducing the plant or selling or using the plant so reproduced.

Section 164.—Assistance of Department of Agriculture

The President may by Executive order direct the Secretary of Agriculture, in accordance with the requests of the Commissioner, for the purpose of carrying into effect the provisions of this title with respect to plants (1) to furnish available information of the Department of Agriculture, (2) to conduct through the appropriate bureau or division of the Department research upon

special problems, or (3) to detail to the Commissioner officers and employees of the Department.

Chapter 16.—Designs

Sec.

171. Patents for designs.

172. Right of priority.

173. Term of design patent.

Section 171.—Patents for designs

(a) Whoever invents any new, original and ornamental design for an article of manufacture may obtain a patent therefor, subject to the conditions and requirements of this title.

(b) The provisions of this title relating to patents for inventions shall apply to patents for designs, except as otherwise provided.

Section 172.—Right of priority

The right of priority provided for by section 119 of this title and the time specified in section 102 (b) of this title shall be six months in the case of designs. Applications for design registrations and such registrations in foreign countries shall have the same effect as applications for design patents and design patents for the purpose of section 102 (b) and 119 of this title.

Section 173.—Term of design patent

Patents for designs may be granted for the term of three years and six months or for seven years, or for fourteen years, from the date of issue, as the applicant, in his application, elects.

Chapter 17.—Secrecy of Certain Inventions and Filing Applications in Foreign Countries

Sec.

181. Secrecy of certain inventions and withholding of patent.

182. Forfeiture of the right to a patent for unauthorized disclosure.

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Section 181.—Secrecy of certain inventions and withholding of patent

(a) Whenever publication or disclosure of an invention in which the Government has a property interest might, in the opinion of the head of an interested Government agency, be detrimental to the national security, the Commissioner upon being so notified shall order that the invention be kept secret and shall withhold publication thereof and the grant of a patent under the conditions set forth hereinafter.

(b) Whenever the publication or disclosure of an invention described in an application in which the Government does not have a property interest, might, in the opinion of the Commissioner, be detrimental to the national security, the Commissioner shall make the application for patent in which such invention is disclosed available for inspection to the Atomic Energy Commission, the Secretary of Defense, and the chief officer of any other department or agency of the Government designated by the President as a defense agency of the United States.

(c) Each individual to whom the application is disclosed shall sign a dated acknowledgment thereof, which acknowledgment shall be entered in the file of the application. If, in the opinion of the Atomic Energy Commission, the Secretary of Defense, or the chief officer of another department or agency so designated, the publication or disclosure of the invention would be detrimental to the national security, the Atomic Energy Commission, the Secretary of Defense, or such other chief officer shall notify the Commissioner and the Commissioner shall order that the invention be kept secret and shall withhold publication and the grant of a patent for such period as the national interest requires, and notify the applicant thereof. Upon proper showing by the head of the department or agency which caused the secrecy order to be issued that the examination of the application might jeopardize the national

interest, the Commissioner shall thereupon maintain the application in a sealed condition and notify the applicant thereof. The applicant whose application has been placed under a secrecy order shall have a right to appeal from the order to the Secretary of Commerce under rules prescribed by him.

(d) An invention shall not be ordered kept secret and publication withheld for a period of more than one year. The Commissioner shall renew the order at the end thereof, or at the end of any renewal period, for additional periods of one year upon notification by the head of the department or agency which caused the order to be issued that an affirmative determination has been made that the national interest continues so to require. An order in effect, or issued, during a time when the United States is at war, shall remain in effect for the duration of hostilities and one year following cessation of hostilities. An order in effect, or issued, during a national emergency declared by the President shall remain in effect for the duration of the national emergency and six months thereafter. The Commissioner may rescind any order upon notification by the head of the department or agency which caused the order to be issued that the publication or disclosure of the invention is no longer deemed detrimental to the national security.

Section 182.—Forfeiture of the right to a patent for unauthorized disclosure

The right to a patent for the invention disclosed in an application for patent subject to an order made pursuant to section 181 of this chapter may be held forfeited upon its being established by the Commissioner that in violation of said order the invention has been published or disclosed or that an application for a patent therefor has been filed in a foreign country by the inventor, his successors, assigns, or legal representatives, or anyone in privity with him or them, without the consent of the Commissioner. The forfeiture shall be held to have occurred as of the time of violation. The consent of the Commissioner shall not be given without the concurrence of the heads of the departments and agencies which caused the order to be issued. A holding of forfeiture shall constitute forfeiture by the applicant, his successors, assigns, or legal representatives, or anyone in privity with him or them, of all claims against the United States based upon such invention.

Section 183.—Right to compensation

An applicant, or patentee, or his legal representatives, whose patent is withheld as herein provided, shall have the right, beginning at the date the applicant is notified that, except for such order, his application is otherwise in condition for allowance, or February 1, 1952, whichever is later, and ending six years after a patent is issued thereon, to apply to the head of any department or agency who caused the order to be issued for compensation for the damage caused by the order of secrecy and/or for the use of the invention by the Government resulting from his disclosure. The right to compensation for use by the Government shall begin on the date of the first use of the invention by the Government and shall terminate not later than twenty years from the actual filing date in the United States. The head of the department or agency is authorized, upon the presentation of the claim, to enter into an agreement with the applicant, or patentee, or his legal representatives, in full settlement for the damage and/or use. This settlement agreement shall be conclusive for all purposes notwithstanding any other provision of law to the contrary. If full settlement of the claim cannot be effected, the head of the department or agency may award and pay to such applicant, or patentee, or his legal representatives, a sum not exceeding 75 per centum of the sum which the head of the department or agency considers just compensation for the damage and/or use. A claimant may bring suit against the United States in the Court of Claims or in the District Court of the United States for the United States for the district in which such claimant is a resident for an amount which when added to the award shall constitute just compensation for the damage and/or use of the invention by the Government. The owner of any patent issued upon an application that was subject to a secrecy order issued pursuant to section 181 of this chapter, who did not apply for compensation as above provided, shall have the right, after the date of issuance of such patent, to bring suit in the Court of Claims for just compensation for the damage caused by reason of the order of secrecy and/or use by the Government of the invention resulting from his disclosure.

The right to compensation for use by the Government shall begin on the date of the first use of the invention by the Government and shall terminate not later than twenty years from the actual filing date in the United States of the patent. In a suit under the provisions of this section the United States may avail itself of all defenses it may plead in an action under section 1498 of title 28. This section shall not confer a right of action on anyone or his successors, assigns, or legal representatives who while in the full-time employment or service of the United States, discovered, invented, or developed the invention on which the claim is based. A patentee receiving a settlement of his claim for damages caused by reason of an order of secrecy from a head of a department or agency or who is awarded compensation for damages caused by reason of an order of secrecy by the Court of Claims shall be required to disclaim the terminal portion of the patent term equal in duration to any extension granted under the provisions of section 154 (c) of this title.

Section 184.—Filing of application in foreign country

(a) Except when authorized by a license obtained from the Commissioner, a person shall not file or cause or authorize to be filed in any foreign country an application for patent or for the registration of a utility model, industrial design or model in respect of an invention made in this country prior to six months after filing an application in the United States, or prior to four months after filing an application for patent on the same ornamental design under section 171 of this title. A license shall not be granted with respect to an invention subject to an order issued by the Commissioner pursuant to section 181 of this chapter without the concurrence of the heads of the departments and agencies which caused the order to be issued. The license may be granted retroactively where an application has been inadvertently filed abroad and the application does not disclose an invention within the scope of section 181 of this chapter.

(b) The term "application" when used in this chapter includes applications and any modifications, amendments, or supplements thereto, or divisions thereof.

(c) No license shall be required subsequent to the filing of a foreign application for any modifications, amendments, or supplements to that foreign application, or divisions thereof, which do not alter the nature of the invention originally disclosed, which are within the scope of the subject matter originally disclosed, and where the filing of the foreign application originally complied with the provisions of this section, unless the applicant has been notified by the Commissioner that a specific license is required for filing such papers in connection with any application.

Section 185.—Patent barred for filing without license

Notwithstanding any other provisions of law any person, and his successors, assigns, or legal representatives, shall not receive a United States patent for an invention if that person, or his successors, assigns, or legal representatives shall, without procuring the license prescribed in section 184 of this title, have made, or consented to or assisted another's making, application in a foreign country for a patent or for the registration of a utility model, industrial design, or model in respect of the invention. A United States patent issued for such invention to such person, his successors, assigns, or legal representatives shall be invalid.

Section 186.—Penalty

Whoever, during the period or period of time an invention has been ordered to be kept secret and the grant of a patent thereon withheld pursuant to section 181 of this title, shall with knowledge of such order and without due authorization, willfully publish or disclose or authorize or cause to be published or disclosed the invention, or material information with respect thereto, or whoever, in violation of the provisions of section 184 of this title, shall file or cause or authorize to be filed in any foreign country an application for patent or for the registration of a utility model, industrial design, or model in respect of an invention made in the United States, shall, upon conviction, be fined not more than \$10,000 or imprisoned for not more than two years, or both.

Section 187.—Nonapplicability to certain persons

The provisions and penalties of this chapter shall not apply to any officer or agent of the United States acting within the scope of his authority, nor to any person acting upon his written instructions or permissions.

Section 188.—Rules and regulations, delegation of power

The Atomic Energy Commission, the Secretary of Defense, the chief officer of any other department or agency of the Government designated by the President as a defense agency of the United States, and the Secretary of Commerce, may separately issue rules and regulations to enable the respective department or agency to carry out the provisions of this chapter, and may delegate any power conferred by this chapter.

Chapter 18—Reexamination after issue: Contested Proceedings

Sec.

191. Reexamination after issue on the basis of publications and patents.

192. Public use, prior inventorship and originality.

193. Priority of invention contest.

194. Effect of proceeding.

195. Settlement agreements.

196. Reissue application.

Section 191—Reexamination after issue on the basis of publication and patents

(a) Any person may, within one year after the issuance of a patent, notify the Commissioner of publications or patents which may have a bearing on the patentability of any claim of the patent, provided such person explains in writing the pertinency of any such publication or patent to at least one claim of the issued patent, and the Commissioner may cause the claims of the patent to be reexamined in the light thereof, under chapter 12 of this title. The patentee may present amended or new claims for such reexamination. No fee shall be charged for such reexamination or any appeal thereon in the Patent Office.

(b) Not later than two months after the expiration of the one year period, the Commissioner shall inform the patentee whether any notice or notices have been filed under this section which may result in reexamination. The identity of the person making the notification under subsection (a) of this section shall be kept in confidence by the Patent Office, and no information concerning the same shall be given without the authority of such person, unless necessary to carry out the provisions of an Act of Congress or in such special circumstances as may be determined by the Commissioner, nor shall any information concerning the same be the subject of discovery or interrogation in a civil action.

(c) Rejection of a claim, on becoming the final judgment in the case, shall constitute cancellation of such claim from the patent, and notice thereof shall be endorsed on copies of the specification of the patent thereafter distributed by the Patent Office. Failure of the patentee to prosecute in accordance with section 133 of this title shall result in the cancellation of any rejected claims of the patent. If the final judgment holds patentable a claim not expressed in the patent, the Commissioner shall issue a certificate stating the fact, under seal, without charge, to be recorded in the records of patents and shall publish a notice thereof in the Official Gazette. A copy of the certificate shall be attached to each copy of the patent thereafter distributed. Upon the issuance of such certificate such claim shall constitute a claim of the patent which shall have the force and effect specified in section 252 of this title with respect to actions for causes thereafter arising.

Section 192.—Public Use, prior inventorship and originality

(a) Within one year after the issuance of a patent any person may notify the Commissioner that:

(1) the invention claimed in such patent was in public use or on sale in this country more than one year before the actual filing date in the United States of the application for such patent;

(2) the subject matter of a claim of the patent is not patentable in such patent under the provisions of section 102 (c) of this title because of prior invention by or on behalf of the party providing the notification; or

(3) the inventor named in such patent was not the original inventor of the subject matter claimed in the patent but derived it from the party providing the notification.

(b) If such person within the time specified above makes a prima facie showing, the matter shall be determined by the Board of Appeals in such proceedings as the Commissioner shall establish and in which proceedings such person shall be entitled to participate as a party.

Section 193.—Priority of invention contest

(a) Whenever there are two applications naming different inventors claiming the same or substantially the same subject matter, a patent shall ordinarily be issued on the application having the earliest actual filing date in the United States, if otherwise allowable. The application having the later filing date in the United States with respect to such subject matter shall be rejected on the basis of such patent. If, within one year after the issuance of the patent or within six months after a rejection of claims in his application on the basis of the invention claimed in the patent, or within such shorter time as fixed by the Commissioner, not less than one month, the applicant for such later filed application, which application is found otherwise allowable, makes a prima facie showing of priority of invention in accordance with sections 102 (c), 119 or 120 of this title, with respect to the actual filing date in the United States of such patent and offers to present evidence in support of such showing, the matter of priority of invention shall be determined by the Board of Appeals in such proceedings as the Commissioner shall establish. The Commissioner upon the institution of proceedings under this section shall issue a patent at the request of such applicant if his application is otherwise allowable. Failure of that applicant to proceed hereunder within the time specified shall preclude such applicant from asserting priority of his invention with respect to the invention claimed in the patent for the purpose of obtaining a patent.

(b) Whenever an otherwise allowable claim of an application is for the same or substantially the same subject matter as a claim of a patent having a later actual filing date in the United States, or for subject matter over which a claim of such patent is unpatentable, the Commissioner may, on his own motion or at the request of the applicant, initiate proceedings under this section on notice to the parties, requiring such patentee to present his prima facie case within a designated time not less than three months. The Commissioner upon the institution of proceedings under this section, shall issue a patent at the request of such applicant if his application is otherwise allowable.

(c) If two applications for the same or substantially the same subject matter have the same actual filing date in the United States, the Commissioner may initiate a priority contest under this section on his own motion whether or not one of the applications may have been issued as a patent. The Commissioner shall, upon the institution of proceedings under this subsection and at the request of either applicant, issue a patent on his otherwise allowable application.

(d) A claim for the same or substantially the same subject matter as a claim of an issued patent may not be made in any application unless such claim is made prior to one year after the date on which the patent was granted.

(e) In any proceeding under this section, the Patent Office or a party may raise the question of the patentability of any claim of the application or patent of one party over the subject matter claimed in the application or patent of the other party and such question may be considered in the proceeding.

Section 194.—Effect of proceeding

(a) The decision of the Board of Appeals in proceedings under section 192 or 193 of this chapter adverse to a claim of an application shall constitute the final refusal by the Patent Office of such claim. A final judgment

adverse to a claim of a patent from which no appeal or other review has been or can be taken or had shall constitute cancellation of such claim from the patent, and notice thereof shall be endorsed on copies of the specification of the patent thereafter distributed by the Patent Office.

(b) Any person who has not proceeded in accordance with the provisions of this chapter shall not be foreclosed or in any way prejudiced with respect to the defense of an infringement suit or affirmative relief under declaratory judgment proceedings.

(c) No person subject to an adverse decision in a proceeding under this chapter shall be foreclosed with respect to asserting comparable grounds in defense of an infringement suit or as a basis for affirmative relief under declaratory judgment proceedings, involving the patent of the successful party.

Section 195.—Settlement agreements

Any agreement or understanding between parties to a proceeding under section 192 or 193 of this chapter, including any collateral agreements referred to therein, made in connection with or in contemplation of the termination of the proceeding shall be in writing and a true copy thereof filed in the Patent Office before the termination of the proceeding as between the said parties to the agreement or understanding. If any party filing the same so requests, the copy shall be kept separate from the file of the proceeding, and made available only to Government agencies on written request, or to any person on a showing of good cause. Failure to file the copy of such agreement or understanding shall render permanently unenforceable such agreement or understanding and any patent of such parties involved in the proceeding or any patent subsequently issued on any application of such parties so involved. The Commissioner may, however, on a showing of good cause for failure to file within the time prescribed, permit the filing of the agreement or understanding during the six month period subsequent to the termination of the proceeding as between the parties to the agreement or understanding.

The Commissioner shall give notice to the parties or their attorneys of record, a reasonable time prior to said termination, of the filing requirement of this section. If the Commissioner gives such notice at a later time, irrespective of the right to file such agreement or understanding within the six-month period on a showing of good cause, the parties may file such agreement or understanding within sixty days of the receipt of such notice.

Any discretionary action of the Commissioner under this subsection shall be reviewable under chapter 7 of title 5, United States Code.

Section 196.—Reissue application

Judgment adverse to a claim of a patent shall not preclude the filing of an application for reissue in accordance with section 251 of this title but matters already decided in a proceeding under this chapter may not be again considered.

PART III—PATENTS AND PROTECTION OF PATENT RIGHTS

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Chapter 25—Amendment and Correction of Patents

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Section 251.—Reissue of defective patents

(a) Whenever any patent is, through error without any deceptive intention, deemed wholly or partly inoperative or invalid, by reason of a defective specification or drawing, or by reason of the patentee claiming more or less than he had a right to claim in the patent, or by reason of failure to cite or adequately distinguish previously uncited prior art, the Commissioner shall, on the surrender of such patent and the payment of the fee required by law, reissue the patent for the invention disclosed in the original patent, and in accordance with a new and amended application, for the unexpired part of the term of the original patent. No new matter shall be introduced into the application for reissue.

(b) The Commissioner may issue several reissued patents for distinct and separate parts of the thing patented, upon demand of the applicant, and upon payment of the required fee for a reissue for each of such reissued patents.

(c) The provisions of this title relating to applications for patent shall be applicable to applications for reissue of a patent, except that the oath of the applicant prescribed by section 115 of this title shall not be required if the application does not seek to enlarge the scope of the claims of the original patent.

(d) No reissued patent shall be granted enlarging the scope of the claims of the original patent unless applied for within one year from the grant of the original patent.

Section 252.—Effect of reissue

(a) The surrender of the original patent shall take effect upon the issue of the reissued patent, and every reissued patent shall have the same effect and operation in law, on the trial of actions for causes thereafter arising, as if the same had been originally granted in such amended form, but in so far as the claims of the original and reissued patents are identical, such surrender shall not affect any action then pending nor abate any cause of action then existing, and the reissued patent, to the extent that its claims are identical with the original patent, shall constitute a continuation thereof and have effect continuously from the date of the original patent.

(b) No reissued patent shall abridge or affect the right of any person or his successors in business who made, purchased or used prior to the grant of a reissue anything patented by the reissued patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased or used, unless the making, using or selling of such thing infringes a valid claim of the reissued patent which was in the original patent. The court before which such matter is in question may provide for the continued manufacture, use or sale of the thing made, purchased or used as specified, or for the manufacture, use or sale of which substantial preparation was made before the grant of the reissue, and it may also provide for the continued practice of any process patented by the reissue, practiced, or for the practice of which substantial preparation was made, prior to the grant of the reissue, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced before the grant of the reissue.

Section 253.—Disclaimer

(a) Whenever, without any deceptive intention, a claim of a patent is invalid the remaining claims shall not thereby be rendered invalid. A patentee, whether of the whole or any sectional interest therein, may, on payment of the fee required by law, make disclaimer of any complete claim, stating therein the extent of his interest in such patent. Such disclaimer shall be in writing and recorded in the Patent Office: and it shall thereafter be considered as part of the original patent to the extent of the interest possessed by the disclaimant and by those claiming under him.

(b) In like manner any patentee or applicant may disclaim or dedicate to the public the entire term, or any terminal part of the term, of the patent granted or to be granted.

Section 254.—Certificate of correction of Patent Office mistake

Whenever a mistake in a patent, incurred through the fault of the Patent Office, is clearly disclosed by the records of the Office, the Commissioner may

issue a certificate of correction stating the fact and nature of such mistake, under seal, without charge, to be recorded in the records of patents. A copy thereof shall be attached to each copy of the patent, and such certificate shall be considered as part of the original patent. Every such patent, together with such certificate, shall have the same effect and operation in law on the trial of actions for causes thereafter arising as if the same had been originally issued in such corrected form. The Commissioner may issue a corrected patent without charge in lieu of and with like effect as a certificate of correction.

Section 255.—Certificate of correction of applicant's mistake

Whenever a mistake of a clerical or typographical nature, or of minor character, which was not the fault of the Patent Office, appears in a patent and a showing has been made that such mistake occurred in good faith, the Commissioner may, upon payment of the required fee, issue a certificate of correction, if the correction does not involve such changes in the patent as would constitute new matter or would require reexamination. A copy thereof shall be attached to each copy of the patent, and such certificate shall be considered as part of the original patent. Every such patent, together with the certificate, shall have the same effect and operation in law on the trial of actions for causes thereafter arising as if the same had been originally issued in such corrected form.

Section 256.—Correction of named inventor

An error in the naming of an inventor, in either a sole or joint application for patent, without deceptive intent, shall not affect validity of a patent, and may be corrected at any time by the Commissioner in accordance with regulations established by him or upon order of a Federal court before which the matter is called in question. Upon such correction the Commissioner shall issue a certificate accordingly.

Section 257.—Certificate for change in status of claims

(a) When any claim in a patent is allowed subsequent to the issuance of the patent under section 155 of this title, the Commissioner shall issue a certificate stating the fact, under seal, without charge, to be recorded in the records of the patent and shall publish a notice thereof in the Official Gazette. Such certificate shall be considered as part of the original patent, and a copy of the certificate shall be attached to each copy of the patent thereafter distributed. Upon the issuance of such certificate, such claim shall constitute a claim of the patent which shall have the force and effect specified in section 154 of this title with respect to actions for causes thereafter arising.

(b) Upon the termination of proceedings on any patent issued pursuant to section 155 of this title, the Commissioner shall attach a certificate to subsequently distributed copies of the patent and publish in the Official Gazette a notice of the final disposition of all claims in the patent which were not allowed at the time such patent was granted.

Chapter 26—Ownership and Assignment

Sec.

261. Transferable and licensable nature of patent rights.

262. Joint owners.

Section 261.—Transferable and licensable nature of patent rights

(a) Subject to the provisions of this title, a patent shall have the attributes of personal property.

(b) An application for patent, a patent, or any interest therein, shall be assignable in law by an instrument in writing and in like manner exclusive rights under an application for patent or patent may be conveyed for the whole or for any specified part of the United States. An applicant or patentee, or his legal representative, may also, at his election, license or waive any of his rights in a patent or application for patent, in whole or in any part thereof, by exclusive or nonexclusive arrangement with parties of his selection.

(c) A certificate of acknowledgment under the hand and official seal of a person authorized to administer oaths within the United States, or in a foreign country, of a diplomatic or consular officer of the United States or an officer authorized to administer oaths whose authority is proved by a

certificate of a diplomatic or consular officer of the United States, shall be prima facie evidence of the execution of an assignment, grant or conveyance of a patent or application for patent.

(d) An assignment, grant, or conveyance shall be void as against any subsequent purchaser or mortgagee for a valuable consideration, without notice, unless it is recorded in the Patent Office within three months from its date or prior to the date of such subsequent purchase or mortgage.

Section 262.—Joint owners

In the absence of any agreement to the contrary, each of the joint owners of a patent may make, use or sell the patented invention without the consent of and without accounting to the other owners.

Chapter 27—Government Interests in Patents

Sec.

267. Time for taking action in Government applications

Section 267.—Time for taking action in Government applications

Notwithstanding the provisions of sections 133 and 151 of this title, the Commissioner may extend the time for taking any action to three years, when an application has become the property of the United States and the head of the appropriate department or agency of the Government has certified to the Commissioner that the invention disclosed therein is important to the armament or defense of the United States.

Chapter 28—Infringement of Patents

Sec.

271. Infringement of patent.

272. Temporary presence in the United States.

Section 271.—Infringement of patent

(a) Except as otherwise provided in this title, whoever without authority makes, uses or sells any patented invention, within the United States during the term of the patent therefor, infringes the patent.

(b) Whoever, without authority, imports into the United States a product made in another country by a process patented in the United States shall be liable as an infringer.

(c) Whoever actively induces infringement of a patent shall be liable as an infringer.

(d) Whoever sells a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as an infringer.

(e) No patent owner otherwise entitled to enforce or seek enforcement of a patent shall be denied relief or deemed guilty of misuse or illegal extension of the patent right by reason of his having done one or more of the following: (1) derived revenue from acts which if performed by another without his consent would constitute infringement of the patent; (2) licensed or authorized another to perform acts which if performed without his consent would constitute infringement of the patent; (3) sought to enforce his patent rights against infringement.

(f) Whenever a licensee under a patent licensing arrangement asserts in appropriate proceedings the invalidity of any patent or of any claim of any patent included in such arrangement (1) the action in which such invalidity is asserted, if then pending in a state court, shall be removed to the district court of the United States for the district embracing the place where such action is pending; and (2) the licensor shall, with respect to such patent or to such claim of such patent, have the option of terminating such arrangement: provided, however, that if any such arrangement is so terminated with respect to less than all of the patents or claims so licensed and the arrangement itself does not provide for, or the parties thereto are unable, within such time as the court may determine to be reasonable, to agree upon the consideration to be paid for the license under the remaining patents or claims, the court in which the invalidity is asserted shall determine a reasonable consideration to be paid for the patents or claims not termi-

nated; provided further, that such termination shall not relieve the licensee of liabilities accrued for the period prior to such termination. Agreement in such a patent licensing arrangement not to contest the validity of any licensed claim or patent shall neither prevent a licensee from asserting invalidity under this subsection nor serve as the basis for the finding of a misuse or illegal extension of the patent right.

(g) No assignor of a patent shall directly or indirectly contest the validity of the patent which he has assigned unless he first offers to restore to the owner of the patent, or for his benefit, the consideration paid by such owner for the patent, or an amount determined by the court to equal the value of such payment. Such restoration must be made regardless of the outcome of the contest, and the court shall provide therefor in its judgment or other final determination, if not previously paid. An assignor proceeding under this subsection shall be precluded from asserting any ground for invalidity known or reasonably available to him at the time his assignment of the patent was made.

(h) (1) No patent owner or applicant for patent shall be guilty of misuse or illegal extension of patent rights solely because he enters into or will only enter into a license agreement granting or waiving rights under the patent that excludes or restricts conduct in a manner that is reasonable under the circumstances, at the time the license agreement is made or offered to be made, to secure to the patent owner the full benefits of his patent grant under this title. The burden of establishing misuse or illegal extension of patent rights shall lie with the party asserting such misuse or illegal extension.

(2) Provided, however, the provisions of this subsection (h) shall not apply to any license arrangement entered into after the effective date of this Act requiring the licensee to adhere to any price with respect to such licensee's sale of any product, or requiring the licensee as a condition of entering into the license:

(a) to purchase unpatented or patented articles from the licensor or from any person designated by the licensor;

(b) to be restricted or limited, directly or indirectly, in the resale of articles which such licensee has purchased;

(c) to refrain from dealing in any product, service or chose in action not within the scope of the patent;

(d) to have joint power with the patent owner or applicant to determine whether additional licenses should be granted; provided further, however, that nothing herein shall be construed to prohibit the grant of a sole or exclusive license with or without the right to sub-license.

(i) No patent applicant or patent owner shall be guilty of misuse or illegal extension of patent rights solely:

(1) because he enters into or offers to enter into an arrangement of assignment, license or waiver of some or all of his patent rights which arrangement includes provisions for the payment of a royalty fee or purchase price:

(a) in any amount, however paid, provided that any amount paid after expiration of a patent is based solely upon activities prior to such expiration;

(b) not measured by the subject matter of the patent or by the extent of use of the right assigned, licensed or waived;

(c) not computed in a manner that segregates the charge for any particular patent, or for any particular claim or claims of one or more patents;

(d) differing from that provided in some other arrangement; or

(2) because he enters into or offers to enter into a nonexclusive exchange of patent rights, with or without the payment or purchase provisions specified in paragraph (1) above.

(j) No patent owner or applicant for patent shall be guilty of misuse or illegal extension of patent rights solely because he licenses less than all the rights which might be licensed under his patent or application for patent, including rights to less than all of the territory, patent term, uses, forms, quantities, or number of operations which might be licensed.

Section 272.—Temporary presence in the United States

The use of any invention in any vessel, aircraft or vehicle of any country which affords similar privileges to vessels, aircraft or vehicles of the United

States, entering the United States temporarily or accidentally, shall not constitute infringement of any patent, if the invention is used exclusively for the needs of the vessel, aircraft or vehicle and is not sold in or used for the manufacture of anything to be sold in or exported from the United States.

Chapter 29—Remedies for Infringement of Patent, and Other Actions

Sec.

281. Remedy for infringement of patent.

282. Presumption of validity; defenses.

283. Injunction.

284. Damages.

285. Attorney fees.

286. Time limitation on damages.

287. Limitation on damages; marking and notice.

288. Action for infringement of a patent containing an invalid claim.

289. Additional remedy for infringement of design patent.

290. Notice of patent suits.

291. Priority of invention between patentees.

292. False marking.

293. Nonresident patentee, service and notice.

294. Arbitration.

Section 281.—Remedy for infringement of patent

A patentee shall have remedy by civil action for infringement of his patent.

Section 282.—Presumption of validity; defenses

(a) A patent shall be presumed valid. Each claim of a patent (whether in independent or dependent form) shall be presumed valid independently of the validity of other claims; dependent claims shall be presumed valid even though dependent upon an invalid claim. The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity. A party challenging the validity of a patent under this title has the burden of establishing invalidity of the claimed invention by clear and convincing evidence.

(b) The following shall be defenses in any action involving the validity or infringement of a patent and shall be pleaded:

(1) Noninfringement, absence of liability for infringement or unenforceability,

(2) Invalidity of the patent or any claim in suit on any ground specified in part II of this title as a condition for patentability: Provided, however, That the validity of a patent may not be questioned solely because of the existence of two or more patents where said patents will expire on the same date as a result of filing on the same date or as a result of a terminal disclaimer pursuant to section 253 of this title so long as the right to sue for infringement of said patents is maintained in the same legal entity,

(3) Invalidity of the patent or any claim in suit for failure to comply with any requirement of sections 112 or 251 of this title,

(4) Any other fact or act made a defense by this title.

(c) In actions involving the validity or infringement of a patent the party asserting invalidity or noninfringement shall give notice in the pleadings or otherwise in writing to the adverse party at least thirty days before the trial, of the country, number, date, and name of the patentee of any patent, the title, date, and page numbers of any publication to be relied upon as anticipation of the patent in suit or as showing the state of the art, and the name and address of any person who may be relied upon as the prior inventor or as having prior knowledge of or as having previously used or offered for sale the invention of the patent in suit. In the absence of such notice proof of the said matters may not be made at the trial except on such terms as the court requires.

Section 283.—Injunction

The several courts having jurisdiction of cases under this title may grant injunctions in accordance with the principles of equity to prevent the violation of any right secured by patent, on such terms as the court deems reasonable.

Section 284.—Damages

(a) Upon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement but in no event less than a reasonable royalty for the use made of the invention by the infringer, together with interest and costs as fixed by the court.

(b) When the damages are not found by a jury, the court shall assess them. In either event the court may increase the damages up to three times the amount found or assessed.

(c) The court may receive expert testimony as an aid to the determination of damages or of what royalty would be reasonable under the circumstances.

Section 285.—Attorney fees

The court in exceptional cases may award reasonable attorney fees to the prevailing party.

Section 286.—Time limitation on damages

(a) Except as otherwise provided by law, no recovery shall be had for any infringement committed more than six years prior to the filing of the complaint or counterclaim for infringement in the action.

(b) In the case of claims against the United States Government for use of a patented invention, the period before bringing suit, up to six years, between the date of receipt of a written claim for compensation by the department or agency of the Government having authority to settle such claim, and the date of mailing by the Government of a notice to the claimant that his claim has been denied shall not be counted as part of the period referred to in the preceding paragraph (a).

Section 287.—Limitation on damages; marking and notice

Patentees, and persons making or selling any patented article for or under them, may give notice to the public that the same is patented, either by fixing thereon the word "patent" or the abbreviation "pat.", together with the number of the patent, or when, from the character of the article, this can not be done, by fixing to it, or to the package wherein one or more of them is contained, a label containing a like notice. In the event of failure so to mark, no damages shall be recovered by the patentee in any action for infringement, except on proof that the infringer was notified of the infringement and continued to infringe thereafter, in which event damages may be recovered only for infringement occurring after such notice. Filing of an action for infringement shall constitute such notice.

Section 288.—Action for infringement of a patent containing an invalid claim

Whenever, without deceptive intention, a claim of a patent is invalid, an action may be maintained for the infringement of a claim of the patent which may be valid.

Section 289.—Additional remedy for infringement of design patent

(a) Whoever during the term of a patent for a design, without license of the owner, (1) applies the patented design, or any colorable imitation thereof, to any article of manufacture for the purpose of sale, or (2) sells or exposes for sale any article of manufacture to which such design or colorable imitation has been applied shall be liable to the owner to the extent of his total profit, but not less than \$250, recoverable in any United States district court having jurisdiction of the parties.

(b) Nothing in this section shall prevent, lessen, or impeach any other remedy which an owner of an infringed patent has under the provisions of this title, but he shall not twice recover the profit made from the infringement.

Section 290.—Notice of patent suits

The clerks of the courts of the United States, within one month after the filing of an action under this title shall give notice thereof in writing to the Commissioner, setting forth so far as known the names and addresses of the parties, name of the inventor, and the designating number of the patent upon which the action has been brought. If any other patent is subsequently included in the action he shall give like notice thereof. Within one month after the decision is rendered or a judgment issued the clerk of the court shall

give notice thereof to the Commissioner. The Commissioner shall, on receipt of such notices, enter the same in the file of such patent.

Section 291.—Priority of invention between patentees

(a) Whenever there are two patents naming different inventors and claiming the same or substantially the same subject matter, the owner of one of the patents may have relief against the owner of the other by civil action and the court may adjudge the question of the validity of any of such patents, in whole or in part. A final judgment in such action adverse to a patentee from which no appeal or other review has been or can be taken or had shall constitute cancellation of the claims involved from the patent, and notice thereof shall be endorsed on copies of the patent thereafter and distributed by the Patent Office.

(b) Such suit may be instituted against the party in interest as shown by the records of the Patent Office, but any party in interest may become a party to the action. If there be adverse parties residing in a plurality of districts not embraced within the same state, or an adverse party residing in a foreign country, the United States District Court for the District of Columbia shall have jurisdiction and may issue summons against the adverse parties directed to the marshal of any district in which any adverse party resides. Summons against adverse parties residing in foreign countries may be served by publication or otherwise as the court directs. The Commissioner shall not be made a party but he shall be notified of the filing of the suit by the clerk of the court in which it is filed and shall have the right to intervene.

Section 292.—False marking

(a) Whoever, without the consent of the patentee, marks upon, or affixes to, or uses in advertising in connection with anything made, used, or sold by him, the name or any imitation of the name of the patentee, the patent number, or the words "patent", "patentee", or the like, with the intent of counterfeiting or imitating the mark of the patentee, or of deceiving the public and inducing them to believe that the thing was made or sold by or with the consent of the patentee; or

Whoever marks upon, or affixes to, or uses in advertising in connection with any unpatented article, the word "patent" or any word or number importing that the same is patented, for the purpose of deceiving the public; or

Whoever marks upon, or affixes to, or uses in advertising in connection with any article, the words "patent applied for," "patent pending", or any word importing that an application for patent has been made, when no application for patent has been made, or if made, is not pending, for the purpose of deceiving the public—

Shall be fined not more than \$500 for every such offense.

(b) Any person may sue for the penalty, in which event one-half shall go to the person suing and the other to the use of the United States.

Section 293.—Nonresident patentee; service and notice

Every patentee not residing in the United States may file in the Patent Office a written designation stating the name and address of a person residing within the United States on whom may be served process or notice of proceedings affecting the patent or rights thereunder. If the person designated cannot be found at the address given in the last designation, or if no person has been designated, the United States District Court for the District of Columbia shall have jurisdiction and summons shall be served by publication or otherwise as the court directs. The court shall have the same jurisdiction to take any action respecting the patent or rights thereunder that it would have if the patentee were personally within the jurisdiction of the court.

Section 294.—Arbitration

A written provision in any agreement or contract to settle by arbitration any controversy thereafter arising out of such contract or agreement in respect to the infringement or validity of any patent involved in said contract or agreement, or an agreement in writing to settle by arbitration an existing controversy in respect to the infringement or validity of any patent, shall be valid, irrevocable, and enforceable, except for any grounds as exist at law or in equity for the revocation of any contract. Arbitration of such controversies, awards, and confirmation of awards shall be governed by Title 9, United States Code. In any such arbitration, the defenses provided for under Section 282 of this title shall be considered by the arbitrator.

*Chapter 30—Preservation of Other Rights**Section 301.—Preservation of other rights; non-preemption*

This title shall not be construed to preempt rights or obligations not arising by operation of this title whether arising by operation of State or Federal law of contracts, of confidential or proprietary information, of trade secrets, of unfair competition.

STATEMENT OF C. MARSHALL DANN, PRESIDENT, AMERICAN PATENT LAW ASSOCIATION; ACCOMPANIED BY JOHN T. KELTON, PRESIDENT-ELECT, AMERICAN PATENT LAW ASSOCIATION

Mr. DANN. We are pleased to have this chance to comment on these provisions of S. 1321.

Our association has not recently taken a position expressly on any of the five topics that these hearings are directed to, but in approving this proposed version of a general patent revision bill, we obviously have expressed preferences, and in that sense we can be said to have taken positions.

Of the five subjects, we have expressed ourselves in favor of a limited adversary examination proceeding. In the other four topics, our preferences have been the other way, that is, they are not in accord with S. 1321.

We feel very strongly that the incentives of the patent system are badly needed to help solve some of the nation's most critical problems. Anything that makes it more burdensome and more costly to obtain patents is going to reduce the incentives to invent, to disclose, to develop inventions and to commercialize them, and in our opinion, the Nation will be the loser. This goes both for individual inventors and for inventions made by corporate employees.

So this is our basic criterion for judging any proposed changes in the patent laws; what will they do to the incentives that the system is supposed to provide?

Now to the individual topics, first, adversary proceedings during examination. In our proposed bill we have not provided for any opposition or reexamination prior to the issue of a patent, but we have included provision for reexamination after issuance. We very definitely favor providing an opportunity for members of the public to come in with prior art or other information that may show that the invention is not patentable. We are in favor of weeding out undeserving patents. On the other hand, it seems to us that a minimum of chances for harassment of inventors will occur if this is deferred until after the patent has issued.

Our concern with the procedures set forth in section 135 of S. 1321 includes the added expense that will be involved in printing first the application and then the issued patent.

Another concern is what seems to us a very considerable exposure of the applicant to harassment with extensive discovery and full-blown interpartes proceedings, particularly if this occurs before there has been any sort of an examination that gives the applicant a reasonable prospect that his application will materialize into a patent.

Then we also are concerned about the lengthy delays in issuance which could occur if a number of persons chose to come in and intervene or oppose prior to issuance.

If it is decided to adopt adversary examination proceedings prior to issue, we would strongly urge that this not take place until there has been an indication of allowability; also that the term of the patent should not be shortened as a result of the time used during the adversary proceeding, which could be lengthy.

It seems to us desirable to defer the re-examination at least that long, both from the standpoint of the inventor and also from the standpoint of the public. I think the public is not well served by having a flood of applications published which have not been sifted or winnowed in any way, to get them down to the scope that may ultimately emerge as a patent.

It occurs to us that if there is to be re-examination it would be quite desirable to have it performed by some person other than the original examiner. It seems to us that this might give extra objectivity.

Now, turning to the proposal of have a public counsel, we readily agree that patents should not be issued on unpatentable inventions, but we do have some problem in seeing just how the public counsel would materially affect this.

I want to stress that our problem is with the practicality of the proposal rather than the principle. If the public counsel is to do a thorough, independent job of checking the allowability of applications, he is obviously going to need a large staff which would more or less duplicate that of the regular examining corps. Also, some of the duties that are given the public counsel in S. 1321 are already performed by someone in the Patent Office. Thus, the Patent Office solicitor and the law examiner represent the Patent Office in all appeals and contested cases. The commissioner already carries on a quality control program, which could be more effective if he had more funds available for this purpose.

We do not quite see how the public counsel and his staff would know when to intervene in a pending application. There would seem to be the possibility that the regular examining corps would feel somewhat downgraded, and perhaps have its morale affected by what in essence is a new and different supervisory examining corps.

So overall we tend to think that more could be accomplished by expending the money that the public counsel would use in strengthening the examining staff and the present quality control program.

Now turning to deferred examination, we have not made any provision in our bill for this, although obviously it would be worthwhile not having to examine applications which are clearly unpatentable, or that are of no interest to the applicant. But we think there are distinct disadvantages to deferred examination. One of the critical features of it is the necessity to publish the application at an early stage before there has been any indication that it may be allowable. We think this tends to be unfair to the applicant, and will make some inventors keep their inventions secret rather than file on them.

Also, I think there would be an adverse effect on people in industry who might use these inventions. During the period of deferral, there is obviously uncertainty as to what patents may finally be issued and what scope of claims they may have. It seems to us more desirable to proceed expeditiously with examination so that everyone knows what is patented and what is not.

Most places where deferred examination has been introduced it has been an emergency measure, where the tremendous backlog of unexamined applications made it almost necessary to defer examining some of them. The situation here is quite different, because our backlog has been dropping steadily. I don't think anyone really considers it unmanageable today.

Turning to maintenance fees, while the patent bar in this country has been historically and uniformly opposed to maintenance fees, I believe there currently is some sentiment that fees of this type might be preferable to further increases in the filing and issue fees.

We feel strongly that if maintenance fees are put in, they should not be so large as to be punitive or confiscatory. It is a common thing for an inventor to get a patent and not find it possible to commercialize it in the early years. If he is fairly promptly faced with very large amounts that must be paid to keep his patent in force, he may find it necessary to allow it to lapse, when in fact in another year or 2 or at some point the invention might come into use.

The fees called for in S. 1321 seem to us entirely too high. We think fees, whatever their nature, should be kept administratively as simple as possible. They should not vary according to who owns the patent nor should there be special exemptions.

In this connection, we would urge that the whole question of fees be re-examined. At the hearings held before this subcommittee in May 1971, we submitted a report which urged a somewhat different basis for considering the proper level of fees. This was that the cost for the different types of services that are rendered by the Patent Office be considered separately. Thus, the cost of the examination, we felt, should be divided equally between the Patent Office and the applicant, since the examination process is of value both to the applicant and to the public. Then the cost of supplying patent copies and similar services should be charged entirely to the people who receive the services, and the same thing for the trademark operation, which is primarily for the benefit of the applicants.

Then the cost of maintaining search facilities, the library, the printing of patents, seems to us really for the benefit of the public and we feel 100 percent of those costs should be borne by the government.

If this basis of fees were adopted, we think it might well be unnecessary to go to maintenance fees. This basis would seem to us fairer to all concerned than picking an arbitrary overall percentage of fees to be recovered.

Turning to the administrative restructuring of the Patent Office, in our proposed version of a patent law revision bill, we have simply retained the language of the present statute which would leave the Patent Office where it is, in the Department of Commerce. Nevertheless, many of our members would be pleased to see it become an independent agency. We think it would give the commissioner a desirable degree of freedom of operation. There might be countervailing disadvantages of having the Patent Office not part of one of the executive departments. Of course, an alternative would be to make the commissioner become an Assistant Secretary of Commerce, as provided in Senator McClellan's S. 1957.

That, I believe, completes what I have to say on the five topics. The statement that we have filed also notes some other provisions of

S. 1321 that for one reason or another seem undesirable to us, but I will not discuss those unless you would like.

Senator HART. Thank you very much for adhering to the suggestion that we limit the oral presentation to five subjects.

Mr. Kelton, did you care to add anything.

Mr. KELTON. No, Senator, no. I think Mr. Dann has adequately covered the situation.

Senator HART. You tell us that many of your members would like to see the Patent Office become an independent agency. You don't indicate any dissent among your membership with respect to the earlier points and positions that you have taken.

You have 3,800 members. How do you speak for them?

Mr. DANN. Well, Senator, obviously we don't all think alike on all of these questions. Our committees have studied them at length. We have symposia to educate our members. Our committees make recommendations to the board of managers of our association. This has on it about 20 people, and we attempt as well as we can to arrive at positions which we feel reflect the majority views of the association.

Senator HART. It would be fair, then, to say that the position was developed initially by a committee or committees. Their reports were made to you and the members of the board of managers, and the board of managers then evaluated it and took this position.

Mr. DANN. Yes; that is correct.

Senator HART. Would you then for the record let us have the names of the members of the board and their private employment, associations, firms, or whatever?

Mr. DANN. Certainly.

[The information referred to follows:]

AMERICAN PATENT LAW ASSOCIATION,
Arlington, Va., September 12, 1973.

HON. PHILIP A. HART,
*Subcommittee on Patents, Trademarks and Copyrights,
Committee on the Judiciary, U.S. Senate, Washington, D.C.*

DEAR SENATOR HART: Pursuant to the request which you made on September 11 during the hearings on S. 1321, I am writing to advise you and to make of record the names of the members of the Board of Managers of the American Patent Law Association, together with their present affiliations. At present, thirteen of these are members of private law firms and eight are lawyers employed by corporations.

They are as follows:

Robert B. Benson—general patent attorney, Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin

Eugene L. Bernard—partner, Morton, Bernard, Brown, Roberts & Sutherland, Washington, D.C.

C. Marshall Dunn—chief patent counsel, E.I. du Pont de Nemours and Company, Wilmington, Delaware

Donald R. Dunner—partner, Lane, Aitken, Dunner & Ziems, Washington, D.C.

James W. Falk—patent attorney director, Bell Laboratories, Inc., Murray Hill, New Jersey

Thomas E. Fisher—partner, Watts, Hoffman, Fisher & Heinke, Cleveland, Ohio

Howard I. Forman—trademark counsel, The Rohm & Haas Company, Philadelphia, Pa.

Ralph L. Freeland, Jr.—supervising patent lawyer, Chevron Research Company, San Francisco, California

Morton David Goldberg—partner, Schwab & Goldberg, New York, New York

Harlan P. Huebner—partner, Huebner & Worrel, Los Angeles, California

William R. Hulbert—partner, Fish & Richardson, Boston, Massachusetts

Julius Jancin, Jr.—patent counsel, IBM Corporation, Washington, D.C.

John T. Kelton—partner, Watson, Leavenworth, Kelton & Taggart, New York, New York

Edward F. McKie, Jr.—partner, Schuyler, Birch, Swindler, McKie & Beckett, Washington, D.C.

W. Brown Morton, Jr.—partner, Morton, Bernard, Brown, Roberts & Sutherland, Washington, D.C.

Sidney Neuman—partner, Neuman, Williams, Anderson & Olson, Chicago, Illinois

B. R. Pravel—partner, Pravel, Wilson & Matthews, Houston, Texas

James M. Wetzel—partner, Wetzel, Greenawalt & FitzGibbon, Chicago, Illinois

Arthur R. Whale—manager, Organic Chemicals Section, Patent Department, The Dow Chemical Company, Midland, Michigan

George W. Whitney—partner, Brumbaugh, Graves, Donohue & Raymond, New York, New York

Richard C. Willson, Jr.—patent counsel, Marathon Oil Company, Littleton, Colorado

Sincerely,

C. MARSHALL DANN.

Copy to: Mr. Thomas C. Brennan, Chief Counsel, Subcommittee of Patents, Trademarks and Copyrights, Senate Judiciary Committee.

Senator HART. Thank you very much.

Mr. DANN. Thank you, Senator.

Mr. BRENNAN. Mr. Chairman, the next witness is Mr. William E. Schuyler, Jr., who is appearing on behalf of the American Bar Association.

Senator HART. We welcome you back.

Mr. SCHUYLER. Thank you, Mr. Chairman.

Mr. BRENNAN. Mr. Schuyler, you have a prepared statement.

Do you wish to read it in full or have it printed in the record and summarize it as you proceed?

Mr. SCHUYLER. Mr. Brennan, I would prefer to summarize it, I think, in the interests of saving time.

Mr. BRENNAN. Mr. Chairman, may the statement be printed in full at this point in the record?

Senator HART. So ordered.

[The prepared statement of Mr. Schuyler follows:]

STATEMENT OF WILLIAM E. SCHUYLER, JR., ON BEHALF OF AMERICAN BAR ASSOCIATION

Mr. Chairman and members of the subcommittee: My name is William E. Schuyler, Jr. I am a lawyer in private practice in Washington, D.C. and appear today on behalf of the American Bar Association as a former Chairman of its Section of Patent, Trademark and Copyright Law. Currently, I am the delegate representing that Section in the House of Delegates of the American Bar Association.

We appreciate the opportunity to appear before the Subcommittee and supplement testimony at previous hearings on Patent Law Revision. Our Association does not have a position on the creation of an Office of Public Counsel or on administrative restructuring of the Patent Office, so this statement is directed to (A) Public Adversary Proceedings; (B) Deferred Examination; and (C) Patent Office Fees.

A. PUBLIC ADVERSARY PROCEEDINGS

For many years the American Bar Association has advocated a change in the system of examining patent applications to permit the Patent Office

to consider patents and publications cited by the public as evidenced by the following resolution adopted in 1967:

Resolved, That the American Bar Association approves in principle consideration by the Patent Office of patents and publications cited by the public within six months after publication of the application, provided that the application has an opportunity to rebut any determination of unpatentability and also has the opportunity to amend the scope of any claim.

As contemplated by the resolution, a patent application would be published, and the public would have a reasonable period of time within which to cite patents and publications for consideration by the Examiner. Then the applicant would have an opportunity to rebut any holding of unpatentability and/or amend his claims.

This would not be an adversary proceeding as contemplated by Section 135(d) of S. 1321, and certainly does not contemplate an anonymous adversary. The public could submit written arguments or briefs with the citation of prior art. Then, with all the evidence before him, we believe the Examiner in the Patent Office will reach a proper conclusion more expeditiously and economically than would be possible in a full-fledged adversary proceeding.

Experience in other countries indicates that full-fledged adversary proceedings unnecessarily prolong the determination of patentability and unnecessarily burden applicants. Such delays and burdens work to the disadvantage of individuals and smaller businesses. Moreover, applicants fees, as provided in Section 41 of S. 1321, would have to be increased (probably multiplied by a substantial factor) to offset the Patent Office expense of administering adversary proceedings.

Timing of the publication of the application and the period for the public to cite prior art is of utmost importance. It is the position of the American Bar Association that an application should be published only after allowance by the Examiner. This position is established by the following resolution, also adopted in 1967:

Resolved, That the American Bar Association opposes in principle mandatory publication of pending applications without the authority of the applicant before the allowance of the claims thereof, or after the allowance of the claims thereof, without first giving the applicant a reasonable time within which to elect whether or not to abandon the application thereby preventing publication.

From its beginnings, our patent system has preserved the secrecy of an applicant's invention until the scope of patent protection is determined, i.e., until the claims are allowed. Then the applicant has the option of having the patent published or preserving his secrecy by abandoning the application. Mandatory publication of all applications, as provided in Section 122(c) of S. 1321, forces an inventor to decide before filing whether to seek a patent or preserve his invention in secrecy. This will lead to suppression of some portion of technology now available to the public in published patents, but, of course, will correspondingly reduce the load on the Patent Office.

In most other countries, applications for patent are published about 18 months after filing. Multinational corporations, which file applications in many foreign countries, would be unaffected by early publication in the United States, because the technology will be published somewhere in any event. In some instances, even these large organizations restrict filing to the United States to preserve secrecy; if early publication of U.S. patent applications is mandatory, those organizations will probably not file even in the United States.

Smaller companies and individuals who do not normally file applications in other countries will be adversely affected by early publication of their United States applications. Protection of technology is often essential to the survival of smaller companies. Making that technology available to larger competition could be fatal. In such cases, the giants could even prolong the adversary proceedings of S. 1321 until the technology is obsolete. Faced with such alternatives, the smaller companies and individuals will decide to rely on their ability to keep the invention secret which defeats the major purpose of the patent system.

In an effort to protect the interests of individuals and smaller companies, the U.S. Patent Office has set a goal of issuing patents within 18 months of filing and has made substantial progress toward that goal. Achievement

of that goal is a much better solution than mandatory publication of all applications to the detriment of the less affluent applicants.

Practical considerations affect the timing of the publication of applications and the period for citation of prior art by the public.

Each year some 35,000 patent applications are abandoned. With few exceptions, these abandoned applications do not disclose any worthwhile advance in the art, so there is no justification for the cost of publication, much less the imposition of 75% of that cost on applicants (Section 41).

Of the 80,000 applications allowed each year, the Examiner has probably cited the best art in at least 20,000 (25% valid, based on current court statistics) and at least another 20,000 (25%) would be ignored by the public in view of the scope of the allowed claims. By delaying the public participation until after allowance, the number of potential controversies is reduced from 115,000 to something less than 40,000, and the number of publications from 115,000 to 80,000.

Participation by the public should be more viable if it takes place after the issues are narrowed during prosecution. At that time, members of the public may readily determine from consideration of the allowed claims whether the prospective patent will affect their interests. If so, they may have the incentive to expend the time and money necessary to make a search and oppose grant of the patent. On the other hand, if applications are published before prosecution, the claims are unlikely to describe the novel subject matter with precision, and the public will find it that much harder to determine whether the prospective patent may affect their interests.

Consideration may be given to providing for citation of art by the public and reexamination by the Patent Office after the patent issues. This will avoid duplicate publication of both the application and the patent and afford applicants earlier benefits of the patent where there is no citation. Moreover, an applicant with patent in hand will be better able to raise the money to defend against an opposition than if he has no patent at all. Merits of such a procedure were recognized by this Subcommittee in Chapter 18 of S. 643, 92d Congress (Committee Print, October 20, 1971).

B. DEFERRED EXAMINATION

Implicit in any system of deferred examination is the mandatory publication of all applications before examination. For reasons explained above, the American Bar Association is opposed to such mandatory publication.

Moreover, the American Bar Association has opposed proposals for deferred examination and has even opposed legislation proposing to grant the Commissioner of Patents standby authority to institute a system of deferred examination. This position is based on the assessment that it is unnecessary, would be counter-productive, and would needlessly force industry to evaluate hundreds of thousands of unexamined applications.

Deferred examination was adopted by The Netherlands, Germany and Japan as the only solution to insurmountable backlogs of pending applications with resulting long pendency rates. In 1970 Great Britain rejected the deferred examination approach and the British lead has been followed in the current draft of the proposed European Patent.

In the United States, average pendency of patent applications has been reduced from 36 months to 24 months in the last 10 years, and should reach 18 months by 1976. Backlog and long pendency are not problems in the United States, so deferred examination would not solve anything.

Chapter 18 of S. 1321 would result in publication of over 100,000 applications every year. If applicants elect to defer examination, this would total 500,000 unexamined applications added to the search file without clues as to what if any new developments are in them. Each year about 35,000 applications would be added (the number now abandoned each year) which do not disclose any significant advance in the art. With the passage of time, these worthless documents would constitute one-third of the search file, increasing the search time and effort of both Examiners and the public, with a resulting decline in efficiency.

Not only is such proliferation of the search file counter-productive and burdensome, but the Examiner will normally be five years behind the state of the art for which he is responsible. Currently, the Examiner studies new

applications in the order in which they are filed and makes his first action within nine months. By this normal activity he keeps abreast of developments. If examination of most applications is deferred for five years, the Examiner will be able to keep current on developments only by extra effort. When requested to examine a recently filed case, he must update his knowledge of developments disclosed in five years of unexamined applications. Such extra effort, plus the complication of the search file, could easily offset the savings effected by applicants' failing to request examination within the five-year period.

Finally, the burden on industry to evaluate five years of unexamined applications would more than offset any predicted saving by a system of deferred examination. Imperfect as the present system may be, it eliminates 30% of the applications filed and provides patents with claims defining precisely what invention is covered by the patent. Everyone desiring a new product can, with reasonable effort, determine what, if any, infringement risks exist. To reach the same point when confronted with a five-year accumulation of unexamined applications would take many times the same effort, and in some instances may border on the impossible. Ability to assume such burdens varies in proportion to the size of the business—smaller businesses will suffer more.

These are the main reasons why deferred examination was rejected by Great Britain and by the many nations negotiating the European Patent. Concentration of resources to enable the Patent Office to reach the 18-month pendency goal will best serve American interests at this time.

C. PATENT OFFICE FEES

From time to time the American Bar Association has recognized the need for moderate increases in Patent Office fees to accommodate increased costs and changes in the value of the dollar. Otherwise, the position of the American Bar Association is expressed in the following resolutions adopted in 1967:

Resolved, That the American Bar Association opposes in principle the grant to the Commissioner of a right to fix fees to be paid in connection with the filing, examination and issuance of patents, and records relating thereto, designed to effect an overall recovery of a predetermined percentage of the cost of operation of the Patent Office.

Resolved, That the American Bar Association approves in principle that the Patent Office be supported adequately to insure first class staffing, housing and equipment; that the Patent Office should not be self-sustaining; and that any fees charged should be reasonably apportioned in accordance with the cost of providing the particular service.

Many Patent Office operations do not benefit applicants. For example, publishing (printing) applications and patents is of no value to the applicant or the patentee; it benefits the public at large and customers who purchase printed materials. The public search and library facilities benefit the public at large, not applicants.

Examination of patent applications is in the public interest as well as that of individual applicants, so the cost of the examination service should be apportioned equitably between them.

In 1965 the Congress set a schedule of Patent Office fees designed to recover 65%-75% of the cost of operation; that was an approximation of a fair apportionment at that time. Whether fees are set by the Congress or by the Commissioner, patent application fees should be set to cover a portion of the cost fairly attributable to the examination of patent applications and no other costs. All other costs should be paid from public funds or by customers who receive products or services from the Patent Office.

S. 1321 adds some costs which should be financed from public funds, as, for example, the Public Counsel [Sec. 3(d)]; search facilities in various parts of the United States [Sec. 6(d)]; mechanized searching and research and development for classification and retrieval of prior art [Sec. 6(c)]; publication and dissemination of information [Sec. 8(f)]; Advisory Council on Patent System [Sec. 10]; publication of all applications [Sec. 122]; adversary proceedings [Secs. 135(d) and 137]; and administration of rights of employer-inventor [Sec. 263]. To burden the applicant with 65%-75% of these costs would be unfair. Deficits generated by minimizing fees for certain

types of applications [Sec. 41(b)(1)]; forgiving fees for individuals and small business [Sec. 41(b)(2)]; and deferring payment for those unable to pay [Sec. 41(c)(2)] should be financed from public funds and should not increase the burden for applicants who do not qualify for the benefits.

In the past, the American Bar Association has opposed payment of any fee for the maintenance of a patent right for several reasons. Such fees as provided in Section 41(c)(1) of S. 1321 are in effect discriminatory taxes imposed upon the owner of a patent added to the other taxes he pays. Income from maintenance fees is received long after the service is rendered and is difficult, if not impossible, to coordinate with anticipated costs 10 or 15 years in the future. Threatened cancellation of a patent for failure to pay the maintenance fee penalizes the inventor who is ahead of his time.

Larger businesses see advantages in weeding out large numbers of patents which present potential infringement problems. Such larger businesses are better able to evaluate the potential of patents and finance the maintenance fees than are smaller businesses. Forgiving and deferring fees for small business or individual applicants and patentees can be accomplished only after presentation of the case to the Patent Office. This will involve cost of administration by the Patent Office, and attorney's fees and expenses paid by applicants and patentees.

On balance, the American Bar Association has favored reasonable fees for all applicants paid at the time of application and/or issuance rather than imposing maintenance fees on some patent owners in the future.

D. CONCLUSIONS

In summary, the American Bar Association recommends that the Patent Office consider patents and publications cited by the public after publication of the application or patent, provided the applicant or patentee has an opportunity to rebut the citation and/or amend claims; that any publication of an application take place only after allowance of the claims; that deferred examination be eliminated from S. 1321; and that Patent Office fees be apportioned between applicants and the public in proportion to the benefits accruing to each.

STATEMENT OF WILLIAM E. SCHUYLER, JR., ESQ., ON BEHALF OF THE AMERICAN BAR ASSOCIATION

Mr. SCHUYLER. My name is William Schuyler. I am presently practicing law in Washington, D.C. My appearance today is on behalf of the American Bar Association. I am a former chairman of the Section of Patent, Trademarks and Copyright Law, and at the present time I represent that section in the House of Delegates of the American Bar Association.

The American Bar Association does not have a position on the matter of the administrative structuring of the Patent Office and its relationship to the Department of Commerce, nor do we have a position on the proposal of S. 1321 concerning the Office of Public Counsel. So I will direct my remarks, as our statement does, to the other three points to which these hearings are limited.

Both with respect to public adversary proceedings and with respect to deferred examination, we have the matter of the timing of the publication of the application for the patent. I concur in the points made by Mr. Dann concerning the timing of this publication. I will try not to repeat the same reasons, why we oppose an early publication of a patent application.

Historically, the patent applicant has been able to defer until his application was allowed, his decision whether or not he would accept the protection of the patent or continue the secrecy of his

invention. He makes this choice at that time, fully informed concerning the scope of the patent which he is to get. The validity may still be in question, but the scope of it has been determined.

If there is an earlier publication as proposed by S. 1321, or some other proposals, the inventor must make that decision at the time that he files his application. He must decide whether his chances on obtaining adequate protection justify his immediate publication of what is his own intellectual body. As I refer to individuals, I am very much aware, of course, that a lot of inventive effort is teamwork in corporations, and it may be the research director who must make this decision. But this decision is nonetheless the same. Does the scope of the protection of the patent as estimated at the time of filing, justify the publication of the technology?

We know, at least those of us that have engaged in this practice of patent law for some time, that we have clients who sometimes do not file applications in foreign countries because they do not want to make the decision to have them published promptly. They will file in the United States under present law, because the secrecy is preserved. If we change the law of the United States, the decision must be made, whether or not to file based on an estimate which should involve some study of what protection will be available. Those applicants today who decide not to file in foreign countries, will, under S. 1321, likely decide not to file in the United States. It will depend upon the inherent secrecy of their invention, if it is subject to the maintenance of that secrecy. Some are and some are not.

Another reason we oppose this early publication is a rather practical one. Each year the Patent Office has considered some 115,000 patent applications and about 35,000 become abandoned. Most of the abandonments are abandoned because the patent is refused by the Patent Office, presumably because there is no disclosure of an advance in the art. 35,000 patent applications are abandoned, but the secrecy is maintained, if there is anything to be kept secret.

But the more important thing is the public is not burdened with 35,000 disclosures of technical publications that really do not involve any new information.

If you have early publication, there is no way of selecting. All 115,000 or 100,000 plus that are filed each year will be published. Those who try to decide whether or not to engage in the adversary proceedings that are proposed are those who are trying to decide what the patent situation is. They must wade through 35,000 applications, out of 115,000, that do not involve any new technology.

Over a period of time, as we are continuing to publish, 10 to 20 years in the future, we will have approximately one-third of all the published applications in the Patent Office being relatively meaningless to the public at large. The mere cost of publishing 35,000 applications, which do not add particularly to the art, is a pretty staggering figure; and I certainly agree with Mr. Dann that even publication of today's patents is for the benefit of the public and not the applicant, and the fee should be borne by the public and not the applicant. Certainly, if we require publication of all applications, if we pass that cost along to the applicant we are going to discourage him further from filing.

I have applied this matter of early publication and our opposition to it to both the adversary proceeding and deferred examination, and we oppose the present bill in those respects for that reason.

On the matter of adversary proceedings alone, we have recognized for many years in the American Bar Association the desirability of having the public given an opportunity to participate in the determination of the patent protection that is given to an inventor.

We think that the solution evolved by this subcommittee in the last Congress is a very adequate solution to that problem. If, as proposed by S. 1321, the application is published and the public is charged with offering evidence or opposing the issuance of a patent, then we will have difficulty in determining just what the published application will produce in the way of patent protection.

We know that about a third of those applications would not be issued in any event. We have no way of determining which two-thirds are viable. Certainly a large portion of all applications would be of little interest to most members of the public. To try to determine by reviewing 100,000 or 115,000 applications a year which ones are likely to interfere with a particular client's business would present me with an almost insurmountable obstacle in trying to represent patent owners and invention users both large and small. The burden would be one which the large organization would better bear than a smaller one.

I think that a decision of whether or not to offer help to the Patent Office is rendered extremely difficult if the public does not know in advance what likely scope of protection will be afforded.

So we would think that the adversary proceedings as proposed by S. 1321, while theoretically would produce patents having a greater percentage of validity, the practical application would certainly be a lawyer's paradise and provide for 100,000 potential lawsuits, in effect, each year.

But that is not why I am here. I am here testifying for inventors and patent owners, and I believe in their best interest and in the interest of the public that a deferral of any public participation until the scope of protection is determined would be preferable.

So we would favor public citation of publications and prior art at a time that the application has been allowed, that the scope of the claims has been determined. This may be considered perhaps an initial screening, but it will make the public effort much more significant and much more to the point.

Finally, the adversary proceedings, when they occur before issuance of the patent, are likely to prolong the time that it takes an applicant to obtain his patent. Where there is an actual contest, as is the case in Germany, for example, we know that these can even be prolonged for the life of the patent where a patent runs from the filing date.

Here again the smaller company is at a disadvantage with respect to the larger one, both in the matter of resources and in the importance of early issuance of the patent.

Deferred examination was adopted in Germany and the Netherlands because those two countries had insurmountable backlogs. They just had pending applications in such numbers they could not see

any daylight ahead; and the same situation occurred most recently in Japan. The United States does not face that kind of situation.

The Patent Office has for many years been working and gaining on its backlog. Ten years ago it took 3 years to obtain a patent; today it takes less than 2. Indications are that in another 2 or 3 years the Patent Office will be issuing patents within 18 months.

In many other countries and in those countries where we have deferred examination, applications are published in about 18 months. It is our position, in the American way, concentration of resources on giving the inventor his patent within 18 months would not only answer those who want immediate publication of the technology, but also would give the inventor and businesses, both large and small, prompt knowledge of what the scope of the protection will be. We see no need for deferred examination in the United States today.

Now, on the matter of Patent Office fees I would agree again with what Mr. Dann said, that the fees fall into three categories. Some are paid for services rendered by the Patent Office to particular customers, and those certainly should be borne 100 percent by the customers receiving the service. There are others which benefit the patent applicant, primarily the portion of the cost of the patent examination. Here again, even the examination is conducted as much for the public benefit as for the benefit of each applicant. So we think some apportionment of the cost of examining patents is in order.

Finally, there are large numbers of functions performed by the Patent Office which are for the benefit of the public. The major one is the printing of patents. This does not benefit the inventor; it's primarily for the benefit of the public, and we believe that that cost should be borne 100 percent from public funds.

In my statement I have indicated a number of new proposals in S. 1321 which likewise are for the public benefit, and we believe should be financed from public funds.

That concludes my effort to summarize my statement, Mr. Chairman.

Senator HART. Thank you very much.

Let me for the record develop with you, as we did with the Patent Bar, the membership that was involved in developing the ABA position. I know that the ABA—well, let me say I know that the general membership does not take a position. We do not get polled. I know there is some procedure that is intended to develop a position based on the opinions of at least some sections of the ABA. You are here explaining that with respect to several of the five topics. The ABA has not taken a position with respect to three. I think it was.

How did that position evolve?

Mr. SCHUYLER. The beginning is in committees of the section of patent, trademark, and copyright law. The ABA—I am not sure I am up to date—but has something on the magnitude of 150,000 members. The patent section, the patent, trademark, and copyright law section has, I believe, 4,300 members. About 1,500 of those 4,300 serve on committees of the section of patent, trademark, and copyright law.

The positions are initially evolved by members of particular committees having particular jurisdiction. I believe there are some 40 or 50 committees. The position is published in a printed report about 2 weeks to a month before the annual meeting of the Association. When the section holds its annual meeting, the report of the committee is presented by the committee chairman to this meeting of the section, usually attended by 300 to 500 members. It is then debated as a resolution and a vote of the members present is taken. A majority vote of the members present is necessary to establish a position of the section, but any member of the American Bar Association is prohibited from testifying at a committee like this on a section position.

That section position is next presented to the house of delegates, which comprises about 300 members; and there are only two patent lawyers in the house of delegates. The majority vote of the house of delegates on a resolution is required before I can appear here and represent the American Bar Association in those positions.

The resolutions set forth in our statement have followed that process.

Senator HART. You cite a 1967 ABA resolution. Am I to understand that that is the last time that the ABA has in its house of delegates taken a position which enables you to come in?

Mr. SCHUYLER. Yes, sir. Unless the section takes a different position. And there again, to change the ABA position it must go back through the house of delegates. So the house of delegates' position remains the policy of the American Bar Association until it is changed.

Senator HART. We all have sensitivity about our own bills. It is not as great as people suspect. S. 1321 was not born in 1967. How do you come in and react to S. 1321?

Mr. SCHUYLER. Mr. Chairman, we are not here today either opposing or favoring S. 1321 in its entirety. The three points which are raised here are issues that have been before this subcommittee on previous occasions. They, in substance, appeared in the report of the President's commission not even for the first time there, but they did appear there; and the timing of the 1967 position are geared in the report of the President's commission.

The matter of adversary proceedings and deferred examination were rather important issues at that time. They were considered by the American Bar Association at that time, and there has been no change in the position of the Association since that time.

Senator HART. Turning to the items on which the ABA takes no position, one is whether the Patent Office should be made independent of the Department of Commerce. Would you be in a position as an individual not speaking for the association to react to that?

Mr. SCHUYLER. I have my personal views, Mr. Chairman. I would be glad, if they would be of any benefit, to express them. It must be clear that they are not the views of the American Bar Association.

Senator HART. Having made that clear, the committee would be benefited by hearing them I am sure.

Mr. SCHUYLER. In my opinion the Patent Office should be an independent agency only if the Commissioner of Patents is at a suffi-

ciently high level where his voice can be heard. I would think that a level 2 in the five-level executive scale would be a proper place for such an important office if it is an independent agency.

I do not believe from my experience that the presence of the Patent Office in the Department of Commerce results in any undue influence. No influence was exerted on me as Commissioner with respect to any application, and I did not exert any influence on any examiner with respect to any particular application. So the need to have it as an independent agency would not be supported by that reason.

I think as a patent lawyer I would be very proud to have a Patent Office as an independent agency with a Commissioner having a high enough stature to be heard. If he is at a level 4, as provided here, I am afraid he would be a voice in the wilderness. And I would believe that it would be better if he remained in the Department of Commerce where the Secretary of Commerce could speak for the Patent Office.

If I may make one further statement along that line, I have opposed the present organization of the Department of Commerce since the time it was inaugurated. I believe about 1962 or 1963, with the Patent Office reporting to the Assistant Secretary for Science and Technology.

If the Patent Office remains in the Department of Commerce, I believe that it should be either itself elevated to the position comparable to Assistant Secretary, or it should report through some other branch that is business oriented and commerce oriented rather than science oriented.

The patent system serves the scientist, but it is really the business incentives that are so very important. Based on my experience before I was Commissioner, and during the time I was a Commissioner, speaking very personally, I believe that the Patent Office would have been better off if it had not been reporting to the Assistant Secretary for Science and Technology.

I believe that Senator McClellan has a bill pending that would make the Department of Commerce have an Assistant Secretary for Patents and Trademarks, and I would support that. I would likewise support a bill that created an independent agency if the Commissioner were at a high enough level like level 2.

Those are my personal views, Mr. Chairman.

Senator HART. If you had your druthers, would you go for an Assistant Secretary in the Department of Commerce or an independent agency at the adequate level?

Mr. SCHUYLER. I hesitate—I would like to think about it for a minute, Mr. Chairman, because no one has ever proposed a high enough level. If it were, I think I would support the independent agency, because I would be proud—I am proud to be part of the system, and I think that would increase its prestige.

Senator HART. One of the objectives that I think all of us seek is to raise the level of disclosure made to the Patent Office to eliminate those decisions that are bad because of a lack of information.

The bill that the subcommittee reported in 1971 and S. 1321, in an attempt to achieve this objective, contained a section 115, a re-

quirement for a comprehensive oath, and section 131, a mandatory patentability.

Now, as I understand it, the mandatory citation of published prior art was proposed by the Patent Office back in 1963, and when you were Commissioner in 1969, the Patent Office proposed a rule that required submission of all prior art specifically considered in preparing the application and of a patentability brief containing arguments explaining why the claims were deemed patentable over the art identified.

Both of those rules were opposed. I am told, by the patent bar, and to the best of my knowledge they have never been implemented by the Patent Office. And in October 1969, in the APLA bulletin, you were quoted, "The response we had to the publication of the proposed rule has been mostly negative. The patent bar is resisting change."

Can you tell me why rules such as those, which in the judgment of the Patent Office reflected progress, were not adopted?

Mr. SCHUYLER. I do not remember the 1963 proposed rulemaking. I was—about that time or shortly after that I was a member of the Patent Advisory Committee of the Department of Commerce. There was a proposal which I at that time—now, speaking individually still, Mr. Chairman—at that time supported that there be a mandatory requirement for at least a citation of the best art known to the applicant.

Some patent examiners were polled, and they said that it would not help them. I had difficulty understanding that at that time and still do; but that was one reason I believe that the Patent Office at that time did not implement the rule if it reached the point of a proposed rule.

For many years a large number of applicants have been submitting the prior art that was known to them to the examiner; and I guess the examiners, based on that experience, said it was not helping them. I am not going to try to explain that statement, but that is what was stated to me in the mid-1960's.

In 1969 the section of patent, trademark, and copyright law favored a patentability brief provided there were certain safeguards that protected the applicant and his attorney from a charge of fraud in the event that there was some inadvertent omission on it. I do not believe that position was ever taken to the House of Delegates, so I cannot explain it as a position of the American Bar Association. But based on the attitude of the lawyers who were present at that meeting—and it occurred in Dallas, and I was there; I proposed a rule again—I did not, as I recall, make a decision not to implement the rule. I believe we were still studying it. There was some negative reaction at the hearings that we held, but—I may be mistaken. This is entirely recollection, and I could review files and give a definite answer. But my recollection is that I did not withdraw that from the procedure; that it was still pending when I resigned. I would personally still support it.

Senator HART. As everybody in this room knows, I would not recognize a patent if I fell over it. But those recommendations that you are talking about, citation of the prior art in the patentability

brief—as an outsider, it makes eminently good sense that I find it difficult to stop pushing you to see who in God's name really thinks it is crazy.

You say in 1963, the examiners thought it would not be helpful?

Mr. SCHUYLER. I was told that, Mr. Chairman.

Senator HART. But in 1973, the Journal of the Patent Office Society in an editorial supported the patentability brief. The Journal, as I understand it, reflects the examiners' views.

You say you have not decided, and it is subject to correction for the record, if on further thought you discover that your memory is bad. Is the decision to implement those rules the Commissioner's decision, or does he have to run it by the Secretary of Commerce? Clearly he runs it by the patent bar.

Mr. SCHUYLER. The decision, when I was there, was the Commissioner's decision. It had to be approved by the Assistant Secretary of Commerce for Science and Technology. I do not recall having anything like that disapproved which I had sent up. It did require that approval in order to be made part of the Patent Office rules.

But title 35 gives the Commissioner the power to establish rules of practice, and this is a change in the rule which could be implemented by the Commissioner. Of course, the Commissioner is subject to the Secretary of Commerce and that has been delegated to the Assistant Secretary for Science and Technology.

Senator HART. Mr. Brennan?

Mr. BRENNAN. Mr. Schuyler, I would like to follow the chairman's lead in asking you some questions relating to the Office of Patent Commissioner.

The prepared statement of the next witness contains a number of comments about individuals who have served as Commissioner of Patents. I would like to read excerpts from that statement and then invite your comments.

Mr. SCHUYLER. I have not seen the statement.

Mr. BRENNAN. I will read it. It is the statement of Edward S. Irons, the next witness.

The office of Patent Commissioner has long been a political plum awarded to patent lawyers in the service of business interests. The strategy of these Commissioners has been and is to join with the organized patent bar from which they came in importuning Congress to enact invalid legislation purporting to lower the constitutional patentability standard to the level to which the agency and the patent bar subscribe.

Would you care to comment on those statements?

Mr. SCHUYLER. I have not engaged in any political activity. So I do not understand the matter of "political plum." It cost me \$100,000 after taxes to be in that office for the period I was there. If that is a political plum, I do not have a very good sense of values.

Mr. BRENNAN. Are you aware of any recent Commissioner who was appointed to that office following active political activity?

Mr. SCHUYLER. Not any recent Commissioner, not any Commissioner in the last half century.

Mr. BRENNAN. I would like to invite your comment on another statement of the next witness.

He indicates on page 10 of his prepared statement that under your administration of the Patent Office, the standard of patentability reached "a new low."

Would you care to comment on that?

Mr. SCHUYLER. I would refer Mr. Irons to the statistics of the Patent Office, which are the best measure that I have. The percentage of applications allowed has remained substantially unchanged. I have to assume that the cross-section of applications filed has remained substantially constant, I cannot imagine anything that is going to change that.

But if the standard has been lowered, I would think a larger percentage of applications would be allowed. While I was there, I watched that and it remained about 70 percent, as I recall, of all applications were allowed. And that did not change materially while I was in office.

Mr. BRENNAN. Thank you.

On another subject, and again from your personal knowledge if you had a choice between a fee schedule where you had an issue fee in the range of \$200 to \$300, as opposed to establishing maintenance fees, what would be your personal preference?

Mr. SCHUYLER. I do not find an issue fee of \$200 or \$300 shocking, particularly in today's economy. And I think that having the money now and knowing that you are going to get it and spreading it among 80,000 patentees a year instead of guessing how much you are going to get in the future, it would be better to have the issue fee originally.

Mr. BRENNAN. Thank you.

No further questions.

Senator HART. Mr. Schuyler, thank you very much for your testimony.

Mr. SCHUYLER. Thank you very much. It is a pleasure to be here.

Mr. BRENNAN. Mr. Edward S. Irons.

Mr. HART. Mr. Irons, a portion of your testimony has already been given. I must confess I have not read any of it.

I encourage you to respond in any fashion that you would like.

Mr. BRENNAN. Mr. Irons, do you wish to have your entire statement printed at this point in full in the record?

Mr. IRONS. Yes, Mr. Brennan.

Thank you.

[The prepared statement of Edward S. Irons follows:]

STATEMENT OF EDWARD S. IRONS, LAWYER, WASHINGTON, D.C.

Honorable Chairman and members of the Subcommittee, I am pleased to appear at this hearing to testify with respect to S. 1321. In this statement I have attempted to provide certain fundamental background information which is deemed essential to a proper understanding of the issues raised by the specific provisions of S. 1321 with which this hearing is particularly concerned.

I. INTRODUCTION

Emphasizing the constitutionally mandated paramount public interest, the Supreme Court has repeatedly admonished for 150 years that it is not a "primary purpose of the patent system --- to create private fortunes for the owners of patents".¹ Nevertheless, owners of patent monopolies have relentlessly continued to pressure the Patent Office, the courts and, most of all, the

¹ *Motion Picture Patents Co. v. Universal Film Mfg. Co.*, 243 U.S. 502 (1917). See e.g., *Pennock v. Dialogue*, 27 U.S. 327 (1829); *Kendall v. Winsor*, 62 U.S. 322 (1859); *Lear, Inc. v. John S. Adkins*, 395 U.S. 653 (1969); *Blonder-Tongue Laboratories, Inc. v. University of Illinois Foundation*, 402 U.S. 313 (1971); *DeepSouth Packing Co., Inc. v. The Laitram Co.*, 406 U.S. 518 (1972).

Congress to invert this order of priorities to render the patent system a tool of private investors. It is said that patents must be awarded for participation in all research and development, even of the most pedestrian type, in order to foster investment in further research and development. It is darkly predicted that if patents are issued, as the Constitution requires, solely as a stimulus to high quality technological advancement, business will not invest in the work needed to convert inventions into marketable products or, in economists' parlance, "innovations".

To date only the Patent Office has capitulated.² In defiance of constitutional and statutory restraints as explicated by the Supreme Court, the Patent Office has not only continued its operational policies unchanged but has joined forces with the patent owners on all fronts.³

In implementation of this false philosophy, the Patent Office churns out tens of thousands of patents annually granting monopolies to private interests in trivial "inventions" often representing no advancement in technology at all.⁴

The small percentage of these patents which cover technology that finds wide commercial acceptance virtually all encounter litigation in the courts—and of those, one quarter or less survive as actually comporting with the statutory and constitutional requisites of a valid patent. This high incidence of invalid patents among those of true commercial significance is symptomatic of a deep conceptual and philosophical division between the Patent Office and the courts as to the correct function of the patent system in contemporary society.

This division can be traced to at least two major defects in the patent granting process. The antiquated procedural handling of patent applications has not changed substantially since 1836.⁵ In addition, the false philosophy that private business interests are paramount dominates the Patent Office even as it also dominates the Department of Commerce of which the Patent Office is now a part.

S. 1321 is an informed major effort toward both modernization of Patent Office procedural machinery to put it on a par with that of other government administrative agencies and revision of Patent Office philosophy outlook to insure that private patent monopolies clearly satisfy all constitutional and statutory prerequisites.

S. 1321 is a refreshing and much needed departure from S. 643 of the 92nd Congress and anticipated patent "reform" bills soon to be introduced in this Congress which, like the 1952 Act, were essentially written by the

² With the exception, in the congressional context, of the enactment of the apparently unconstitutional Public Law 91-577 which authorizes the grant of private patent monopolies for *merely novel* sexual reproduced plants and, in the judicial context, of certain pronouncements by the United States Court of Customs and Patent Appeals, now preponderantly composed of ex-patent lawyer judges. Note the reversal of the Court of Customs and Patent Appeals decisions by the Supreme Court in *Brenner v. Manson*, 383 U.S. 519 (1966), and *Gottschalk v. Benson*, — U.S. —, 34 L. Ed. 2d 273 (1972).

³ "... [T]he bulk of [patent lawyers'] services to clients consists of helping them obtain and defend the validity of patents. Quite naturally then they tend to identify the good with more patents rather than fewer, just as does the Patent Office for a different but parallel set of reasons. Thus the Patent Office and the patent bar comprise a powerful, 'pro-patent' pressure group.

"Because no group of lawyers and no government agency specializes in fighting against patents, and no particular segment of the business community is uniformly harmed by patents, there is no 'antipatent' pressure group..." M. Shapiro, "The Supreme Court and Administrative Agencies", *The Free Press*, N.Y., 1968, p. 206.

⁴ "It is now a truism among patent lawyers that if you sit around the Patent Office long enough, and change your claims often enough, you will eventually get some kind of a patent on almost anything", M. Shapiro, "The Supreme Court and Administrative Agencies", *The Free Press*, N.Y., 1968, p. 189.

"In fact, very few of the seventy thousand patents granted each year actually constitute genuinely novel and significant inventions. The vast bulk represent minor changes in the current art, fanciful gimmicks, molecular modifications, even plagiarized versions of other patents", Green, "The Monopoly Makers", *Grossman Publishers*, N.Y., 1973, p. 305.

⁵ "The Act of 1836 established the pattern for our present system by providing statutory criteria for the issuance of patents and requiring the Patent Office to examine application for conformity therewith... no basic changes have been made in its general character in the succeeding one hundred and thirty years", 1966 Report of the President's Commission on the Patent System, p. 1.

⁶ It is common knowledge that the American Patent Law Association plans to sponsor a patent law revision bill. The administration is known to be considering a bill which presumably will represent an unacceptable compromise between the views of the Department of Justice and the views of the Department of Commerce, the latter synthesized in turn from views of the Patent Office and those of the business groups (including the organized patent bar) to which Commerce is subservient.

patent bar in liaison with the Patent Office to accomplish by legislation enacted by an *uninformed* Congress? what this same pressure group has always failed to accomplish in the courts.

II. PROCEDURAL OBSOLESCENCE

In 1836 when the present examination process was instituted, it was natural and reasonable to provide for only an *ex parte* exchange between applicant and Patent Office with the evidence to be examined confined to that available in files of published material maintained by the Patent Office and that voluntarily supplied by the applicant. Means of communication and travel were then such that any thought of a more searching factual inquiry involving outside evidence and public participation would have been totally infeasible. During the ensuing 140 years, techniques for communication, travel and for the gathering and evaluation of evidence have advanced markedly. The federal government in establishing a plethora of other administrative agencies has taken full advantage of these advances to provide in almost every case for public inter partes adversary proceedings in which interested members of the public have a fair opportunity to be heard. In contrast, the Patent Office stagnated—largely because it was and is in the interests of the business community for it to do so—and society is penalized by a flood of illegitimate private patent monopolies resulting from secret *ex parte* proceedings before an agency which unconstitutionally subordinates the public interest to private gain.

Every federal agency except the Patent Office that is charged with the duty of adjudicating applications for special licenses of franchises⁸ has, by rule or statute or both, subpoena power to compel relevant testimony and document submission, a duty to provide for public hearings and to permit public participation in the submission of relevant evidence and a responsibility to sift all relevant evidence that may be submitted from any source.

The Patent Office, by contrast, has no public hearings and affords no opportunity for public participation in its adjudicatory process. It lacks even the power to compel patent applicants to disgorge all relevant facts of which they may be possessed. Its proceedings are secret. It has resolutely refused—the Freedom of Information Act notwithstanding—to make even its final decisions in the adjudication of cases publicly available.⁹ Its examiners are treated as part of an assembly line team whose product is patents—and the emphasis is not on the quality of the product but on quantity, with progressive imposition of quotas demanding the generation of more and more patents in less and less time.

The result is that nowhere else in our government are franchises so lightly granted or so little respected. The reason is obvious. Within the

⁷ "...But in a very real sense the Patent Office wrote the congressional statute of 1952 as part of its continued battle with the Supreme Court.

⁸ "It had help. The American patent bar is a relatively well-organized group comprehending most of the lawyers who specialize in patent matters, formed into regional associations with a national coordinating hierarchy. As soon as patent law revision was in the wind, this group created a task force of its most prominent leaders to help shape the legislation. This task force became so active in the statute drafting that in the end Mr. Federico [a leading member of the Patent Office bureaucracy] did not so much draft legislation for a congressional committee as *with* the patent bar. Not only did he and three lawyers officially representing the organized patent bar do almost all of the drafting, but the drafts were circulated among all prominent patent lawyers and revised to conform to their desires. [Emphasis in original.]

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⁹ "In any event the propatent forces had a free hand in writing the [1952] legislation unopposed by any countervailing group. Of course the congressman on the subcommittee, and then those on the full Judiciary Committee, all of them lawyers, but none particularly expert on patent matters, did review the draft. But they made few changes, and the Committee's report and 'Revisor's Notes,' which accompanied and explained the bill, were written by Federico, either independently or in cooperation with the representatives of the patent bar. One of those representatives has proudly answered the question: 'Who wrote the patent laws of 1952? *We did!*'" M. Shapiro, "The Supreme Court and Administrative Agencies", *The Free Press*, N.Y., 1968, pp. 205-206, 207; emphasis added.

⁸ "The patent is a privilege...conditioned by a public purpose..." *Blonder-Tongue Laboratories, Inc. v. University of Illinois Foundation*, 402 U.S. 313, 344 (1971), quoting *Mercoind v. Mid-Continent Investment Co.*, 302 U.S. 661, 666 (1944).

⁹ *Irons v. Schuyler*, 465 F. 2d 608 (D.C. Cir. 1972). The paragraph of the affidavit of Patent Office Solicitor Martin quoted in the court's opinion was later shown to be factually inaccurate.

limits of human capability, other agencies act on the basis of all relevant facts after hearing from all interested parties. The Patent Office does not. Moreover, it realistically cannot without a substantial overhauling of its procedural machinery along at least some of the lines contemplated by S. 1321.

In this regard, the following provisions, among others, of S. 1321 are basic and are long overdue:

1. Section 1 which requires the title to be interpreted in light of the "constitutional purpose".

2. Section 3(d) establishing a Public Counsel independent of the agency whose duty it is to "assure as an advocate through the adversary process that high quality patents which meet the statutory and constitutional criteria therefor issue from the Patent Office" and Section 24 which makes it possible for the Public Counsel to discharge his duty by the exercise of a subpoena power to obtain relevant facts, documents and testimony for use in any patent application proceeding.

3. Section 23 affording full subpoena power to the agency itself.

4. Section 122 abolishing excessive secrecy and making patent applications, as well as Patent Office adjudications, open to public scrutiny.

5. Sections 132 and 134 ensuring that a complete written record of proceedings is maintained and made publicly available.

6. Sections 135 and 137 permitting any member of the public to participate fully in the adjudicatory process, *inter alia*, by submitting evidence or argument at any stage of each proceeding.

7. Sections 115 and 131 requiring applicants and their attorneys to submit an identification of all available prior art and other facts relevant to the equities of the application, thereby enabling the examiner to spend less time in searching out this material and affording him more time in which to evaluate the application—and insuring integrity in the patent granting process.

Pursuant to Sections 191-193, moreover, only those patent applications would be subjected to detailed examination on the merits for which the applicant or member of the public had paid a special so-called "examination fee". Thus, by relieving examiners of the obligation to examine fully all patent applications, more time would be afforded for intensive examination of those on which the fee is paid.

III. FALSE PHILOSOPHY

The office of Patent Commissioner has long been a political plum awarded to patent lawyers in the service of business interests. Not surprisingly, the endeavor of the agency under these patent lawyer administrators has been to subsidize research and development by granting as many private patent monopolies as possible without regard to the constitutional and statutory prerequisites of validly patentable invention. The strategy of these Commissioners has been and is to join with the organized patent bar from which they came in importuning Congress to enact invalid legislation purporting to lower the constitutional patentability standard to the level to which the agency and the patent bar subscribe.

A classic example is found in the testimony of Wm. E. Schuyler, Jr. who was at the time of his 1969 nomination to the post of Commissioner and is now a Washington, D.C. patent lawyer representing a plurality of corporate clients. In his May 1969 confirmation hearings before this subcommittee, in response to an inquiry by Senator McClellan with respect to the mortality rate of patents in the courts, Mr. Schuyler expressed his belief, notwithstanding the Supreme Court's reiteration of the constitutional standard of invention in *Graham v. John Deere Co.*, 383 U.S. 1 (1966), "that the Congress in 1952 intended to change the measure of the standard of invention which would be patentable when [it] enacted section 103 of the patent law. The Courts have not, in my view, followed that intention.... I think if the Congress made clear that, in considering the present legislation, its intent is as I viewed it before that the courts will have more guidance in this area" (Hearing Before Subcommittee on Nominations of the Committee on the Judiciary, May 2, 1969, pp. 14-15). Consistent with this attitude, under

the administration of Commissioner Schuyler the agency standard of patentability reached a new low.¹⁰

There are a plurality of ways in which the Patent Office-organized patent bar pressure group seeks to induce congressional subversion of constitutional patent policy. Typical—and of special significance—is the continuing insistence upon legislative erosion of the constitutional patentability standard—effectively countered by S. 1321¹¹—and the related demand for statutory departure from the constitutional requirement that patents be granted to “inventors” to permit issuance of patents to corporations. Sections 111 and 116 of S. 1321 unfortunately and perhaps unintentionally succumb to this demand.

A. The Constitutional Patentability Standard

The principle explicated by the Supreme Court in a consistent line of decisions beginning at least as early as 1885¹² that adjudication of patent validity requires reference to a constitutional standard remained unchallenged until it was reiterated in 1950 in *Great A.P. Tea Co. v. Supermarket Equip. Corp.*, 340 U.S. 147, 154.

After A.&P. patent owners recognized that a successful challenge to the constitutional origin of the patentability standard reiterated by the Supreme Court was essential to the validity of their then-pending “corrective” legislation which ultimately matured as Section 103 of the Patent Act of 1952.¹³

Immediately upon its enactment, Section 103 was advanced as a proper exercise of congressional prerogative which repudiated A.&P. to exclusively define the standard for patentable invention at a level below that which the Court had held to be expressed in the Constitution.¹⁴

¹⁰ It is instructive to note that Commissioner Schuyler has not only returned to the lucrative private practice of patent law but is also the founder and Chairman of the Board of Directors of “Intellectual Property Owners, Inc.” (IPO), a “non-profit corporation” financed by “membership dues” “deductible” as “business expenses”. The “members” of course are corporations and patent lawyers. In short, IPO is a tax-exempt patent lobby. The quotation is from the copyrighted IPO 1973 publication, “The U.S. Patent System Needs Your HELP!” This publication describes four types of corporate membership with dues ranging from \$10,000.00 to \$500.00 annually. Individual dues are \$100.00 annually.

Similarly, ex-Commissioner Edward J. Brenner is the founder and President of the Association for the Advancement of Invention and Innovation, another tax-exempt patent lobby.

¹¹ This insistence has most recently taken the form of a protestation of lack of clarity in the §103 standard consequent from an alleged “conflict” between the Supreme Court’s 1966 decision in *Graham v. John Deere Co.*, 383 U.S. 1, and its 1969 opinion in *Anderson’s-Black Rock v. Pavement Salvage Co.*, 396 U.S. 57. The “conflict” actually does not exist on any fair reading of the two cases in context, the later decision in *Anderson’s-Black Rock* being premised squarely and in terms upon §103 as explicated in *Graham*. To simulate “conflict” it has been necessary to change the whole thrust of *Graham* by focusing upon its passing reference to “secondary considerations... surrounding the origin of the subject matter sought to be patented” which “may have relevancy” “as indicia of obviousness or nonobviousness” as the true test of §103 and then to see as inconsistent with that false test, the Court’s refusal to find “relevancy” in the secondary considerations proved in *Anderson’s-Black Rock*.

In short, the pretense of conflict is just that and the consequent lack of clarity in §103 is equally illusory. The problem of the organized patent bar is that §103 as it now exists does not comport with what the bar wants. Its requirement for a high standard of patentability is, if anything, too clear to be palatable.

¹² “... This court, however, has repeatedly held that, under the Constitution and the Acts of Congress, a person, to be entitled to a patent, must have invented or discovered some new and useful art, machine, manufacture or composition of matter, or some new and useful improvement thereof, and that ‘it is not enough that a thing shall be new, in the sense that in the shape or form in which it is produced it shall not have been before known, and that it shall be useful, but it must, under the Constitution and the Statute, amount to an invention or discovery.’” *Hill v. Wooster*, 132 U.S. 693, 700 (1890), quoting *Thompson v. Boisseleir*, 114 U.S. 1, 11 (1885).

See also *Pennock v. Dialogue*, 27 U.S. 327 (1829); *Atlantic Works v. Brady*, 107 U.S. 182, 200 (1883); *McClain v. Ortmyer*, 141 U.S. 419, 428 (1891); *Ouno Engineering Corp. v. Automatic Devices Corp.*, 314 U.S. 84, 91 (1941); *Graham v. John Deere Co.*, U.S. 1 (1966); *Anderson’s-Black Rock v. Pavement Salvage Co.*, 396 U.S. 57 (1969). And see *Lear v. Adkins*, 395 U.S. 653 (1969); and *Blonder-Tongue Laboratories, Inc. v. University of Illinois Foundation*, 402 U.S. 313 (1971).

Lack of invention was a defense recognized to strike at the root of the whole claim needing “no statute to aid or justify” it and “provable when it exists under any general denial”, *Reckendorfer v. Faber*, 92 U.S. 347, 354 (1876), appropriately raised “*sua sponte*, if the objection was not taken by counsel”, *Slawson v. Grand Steel R.R. Co.*, 107 U.S. 649, 652 (1883).

¹³ See “Efforts to Establish a Statutory Standard of Invention”, Study No. 7 of The Subcommittee on Patents, Trademarks and Copyrights of the Committee on the Judiciary, United States Senate, 85th Cong., 1st Sess.

¹⁴ See Rich, “The Vague Concept of ‘Invention’ As Replaced by Sec. 103 of the 1952 Patent Act”, 46 J. Pat. Off. Soc’y 855 (1964). See also Aitken, “Patents—Standard of Invention—Constitutional or Statutory”, 24 Geo. Wash. L. Rev. 722 (1956).

The majority of the lower courts, having regard to *A.&P.* and similar Supreme Court rulings, correctly held that §103 only codified existing law and hence did not purport to compromise the constitutional patentability standard. A comparatively few conflicting decisions¹⁵ fanned the flames of controversy.

This conflict came to a head when *Graham, supra*, reached the Supreme Court in 1965. Patent owner-petitioner Graham and various of his supporting amici urged that no patentability standard other than mere novelty is written into the Constitution, that §103 is the sole patentability standard, and that the Supreme Court was precluded from repudiating congressional intent as reflected by that statute.¹⁶

The Supreme Court in *Graham, supra*, rejected all of these arguments calculated to insulate the issue of validity from appellate scrutiny, reaffirmed *A.&P.* and emphasized once again that "[I]t must be remembered that the federal patent power stems from a specific constitutional provision" which is "both a grant of power and a limitation" that "Congress in the exercise of the patent power may not overreach the restraints imposed by the stated constitutional purpose" and that the patent system "by constitutional command must 'promote the Progress of...useful Arts'. This is the standard expressed in the Constitution and it may not be ignored. And it is in this light that patent validity 'requires reference to a standard written into the Constitution', *A.&P. Tea Co. v. Supermarket Corp.*", 383 U.S. at 5, 6. Further, the constitutionality of Section 103 was sustained only in view of the Court's finding that the statute "was not intended by Congress to change the general level of patentable invention" but "merely as a codification of judicial precedents...with congressional directions that inquiries into the obviousness of the subject matter sought to be patented are a prerequisite to patentability". In sustaining §103, the Court said, "Approached in this light...the emphasis on nonobviousness is one of inquiry, not quality, and, as such, comports with the constitutional strictures", 383 U.S. at 17.¹⁷

Undaunted by the Supreme Court's refusal to depart from constitutional principle, the patent special interest groups intensified the campaign which they had waged since 1951 both in the courts and in the Congress.¹⁸ Seizing the very next opportunity, the American Patent Law Association in 1971 devoted 15 pages of a 28-page amicus brief in *Blonder-Tongue* to the contention that 35 U.S.C. 103 as construed in *Graham* and *Adams*¹⁹ is "the sole test of patentability", the Constitution notwithstanding. Concurrently—and with total disregard for the apparent unconstitutionality of the proposed statute—Congress was told by many "pro-patent" witnesses appearing at the May 11, 12 and 13, 1971 hearings on S. 643, S. 1253 and S. 1255, 92nd Cong., 1st Sess., that a "crisis" had overtaken the patent system requiring

¹⁵ See "The Standard of Patentability—Judicial Interpretation of Section 103 of the Patent Act", 63 Colum. L. Rev. 306 (1963).

¹⁶ "Since the passage of the 1952 Patent Act the conditions for patentability have been exclusively defined by statute and it is the function of the federal courts to ascertain whether such conditions have been satisfied". Brief of the New York Patent Law Association as *Amicus Curiae* in *Graham v. John Deere Co.*, p. 10.

"In that [1952] Act Congress expressed the judgment that the progress of useful arts would be promoted by application of the standard of unobviousness, as stated in Section 103, as the test of patentability.... It is a judgment in no way inconsistent with the Constitutional grant of power to Congress. And in this connection it must be borne in mind always that the 'role of the judiciary in reviewing the legislative judgment is a narrow one in any case' [citations omitted]. Brief of American Bar Association as *Amicus Curiae* in *Graham v. John Deere Co.*, pp. 17-18.

"Whether a discovery is patentable is under Section 103 not related to any 'standard of invention' as it was by prior case law, now patentability is determined solely by" Section 103. "The constitutional word 'discovery' authorizes Congress if it so elects to protect every original 'finding out' of any nature, whether or not previously known to others or obvious from what others have done". Brief *Amicus Curiae* in Support of Section 103 filed in *Graham v. John Deere Co.* by E. Ernest Goldstein, Professor of Law, University of Texas, p. 8.

¹⁷ These very same constitutional principles were reiterated by the Supreme Court in its 1969 opinion in *Anderson's-Black Rock, supra*, and adverted to in *Lear, supra*, 395 U.S. at 676, and *Blonder-Tongue, supra*, 402 U.S. at 333.

¹⁸ The campaign was successfully extended as well to secure the appointment of "pro-patent" judges to the Court of Claims and the Court of Customs and Patent Appeals as well as a Commissioner of Patents who expressed his rejection of Supreme Court law at his confirmation hearings. See pp. 9-10, *supra*.

¹⁹ *United States v. Adams*, 383 U.S. 39 (1966).

the immediate adoption of a modified version of Section 103 having as its confessed purpose to lower the standard of invention and to legislatively "overrule" *A.&P.* and its progeny.²⁰

In truth, there is *no* place for trivial inventions in the constitutional scheme and the legislation by which the patent pressure groups seek an attempted denigration of the constitutional patentability standard is *invalid on its face*.

At the time the Constitution was adopted, there was a deep-felt need to protect private rights from state and congressional encroachments.²¹ Madison, at the Convention, admonished that "interference" with "the security of private rights and the steady dispensation of justice...were evils which had, more perhaps than anything else, produced this Convention".²² Gouverneur Morris in the Convention stated that "Every man of observation had seen...excesses against personal liability, private property and personal safety".²³ In a letter to Lafayette written in June 1787, Washington wrote that he had attended the Convention to determine "whether we are to have a Government...under which life, liberty, and property will be secured to us".²⁴ Madison, in "The Federalist," adverted to the "alarm for private rights which [is] echoed from one end of the continent to the other".²⁵ In October 1787, Madison wrote to Jefferson that "A reform therefore which does not make some provision for private right must be materially defective".²⁶ Concern that the guarantees written into the Constitution were inadequate led to a struggle for more assured protection against federal encroachments which eventuated in the amendments comprising the Bill of Rights.

These various amendments are limitations upon the authority vested in the Congress by the Constitution itself—including the "limited authority" to authorize the grant of patents for invention.²⁷ Included was the Fifth Amendment which mandates that "No person shall be...deprived of...liberty, or property, without due process of law".

Elucidation of the constitutional standard for patentable invention accordingly entails a balancing of the objective of the patent clause with the paramount "liberty" and "property" concepts of the Fifth Amendment to which all patent laws are subservient.

In 1959 the Court restated the basic premise that "the right to hold specific private employment and to follow a chosen profession free from unreasonable governmental interference comes within the 'liberty' and 'property' concepts of the Fifth Amendment". *Greene v. McElroy*, 360 U.S. 474, 492, citing with approval the 1886 decision in *Allgeyer v. Louisiana*, 165 U.S. 578.

In *Allgeyer v. Louisiana*, 165 U.S. 578, 589-590, the Court held:

"...The liberty mentioned in that [14th] amendment means, not only the right of the citizen to be free from the mere physical restraint of his person, as by incarceration, but the term is deemed to embrace the right of the citizen to *be free in the enjoyment of all his faculties; to be free to use them in all lawful ways; to live and work where he will; to earn his livelihood by any lawful calling; to pursue any livelihood or avocation,*

²⁰ See the "Patent Law Revision" Hearings, etc., Parts 1 and 2.

An informed Subcommittee for Patents, Trademarks and Copyrights of the Senate Committee on the Judiciary rejected the proposed amendment to Section 103 on October 13, 1971.

The "crisis" campaign continues. It may confidently be expected that the same rejected amendment to Section 103 will be reintroduced in at least the forthcoming American Patent Law Association bill.

²¹ See generally, R. Berger, "Congress v. The Supreme Court", Harvard University Press, Cambridge, Mass. (1969), p. 16, et seq.

²² 1 Farrand 134.

²³ 1 Farrand 512.

²⁴ 3 Farrand 34.

²⁵ *Federalist*, No. 10 at 54.

²⁶ 5 *Madison Writings* 27.

²⁷ It is axiomatic that the authority vested in Congress by the body of the Constitution is subservient to the Bill of Rights. Nimmer, "Does Copyright Abridge the First Amendment Guarantees of Free Speech and Press?", 17 U.S.C.A. L. Rev. 1180 (1970), points out that the copyright clause is subservient to the First Amendment and states:

"...If the constitutional grants of power to the Congress were not subject to the limitations imposed by the Bill of Rights, then such limitations would have no meaning at all to a government whose only powers are derived from such grants." (p. 1182, n. 4).

and for that purpose to enter into all contracts which may be proper, necessary, and essential to his carrying out to a successful conclusion the purposes above mentioned.

"It was said by Mr. Justice Bradley in *Butchers' Union S.H.&L. S.L. Co. v. Crescent City L.S.L.&S.H. Co.*, 111 U.S. 746, 742, in the course of his concurring opinion in that case, that 'the right to follow any of the common occupations of life is an inalienable right.... And again, on page 765: 'But if it does not abridge the privileges and immunities of a citizen of the United States to prohibit him from pursuing his chosen calling, *and giving to others the exclusive right of pursuing it*, it certainly does deprive him, to a certain extent, of his liberty; for it takes from him the freedom of adopting and following the pursuit which he prefers; which, as already intimated, is a material part of the liberty of the citizen.' It is true that these remarks were made in regard to questions of *monopoly*, but they well describe the rights which are covered by the word 'liberty' as contained in the 14th Amendment."

Significantly, Mr. Justice Bradley's concurring opinion in *Butchers' Union* adverted to "The granting of patents for invention" as one instance of a legitimate monopoly because "This is done upon a fair consideration", 111 U.S. at 763. But long prior to *Butchers' Union*, "fair consideration" for a constitutionally valid patent had been defined in *Hotchkiss v. Greenwood*, 52 U.S. 248 (1851), as requiring the disclosure of an invention exceeding "the ordinary skill in the art".² The compelling reasons for this patentability standard were more fully explicated fourteen years before *Allgeyer* in *Atlantic Works v. Brady*, 107 U.S. 192, 199-200 (1883) (cited and quoted in 1950 in *A.&P. Tea Co., supra*), as follows:

"The process of development in manufactures creates a constant demand for new applicants, which the skill of ordinary head workmen and engineers is generally adequate to devise, and which, indeed, are the natural and proper outgrowth of such development. Each step forward prepares the way for the next, and each is usually taken by spontaneous trials and attempts in a hundred different places. *To grant to a single party a monopoly of every slight advance made, except where the exercise of invention, somewhat above ordinary mechanical or engineering skill, is distinctly shown, is unjust in principle and injurious in its consequences.*

"The design of the patent laws is to reward those who make some *substantial* discovery or invention, which adds to our knowledge and makes a step in advance in the useful arts. Such inventors are worthy of all favors. It was never the object of those laws to grant a monopoly for every trifling device, every shadow of a shade of an idea, which would naturally and spontaneously occur to any skilled mechanic or operator in the ordinary progress of manufactures...."

See also *Reckendorfer v. Faber*, 92 U.S. 347 (1876); *Concrete Appliances Co. v. Gomery*, 269 U.S. 177 (1925); *Altoona Public Theatres v. American Tri-Ergon Corp.*, 294 U.S. 477 (1935); *Toledo Pressed Steel Co. v. Standard Parts, Inc.*, 307 U.S. 350 (1939); and *Cuno Engineering Corp. v. Automatic Devices Corp.*, 314 U.S. 84 (1941), as well as *Graham* and *Anderson's-Black Rock, supra*.

When the paramount right of every citizen to "earn his livelihood by any lawful calling", and in that pursuit "to be free in the enjoyment of all of his faculties", is contrasted with the "limited authority" conferred by Article I, Sec. 8, Cl. 8 to grant private monopolies but only "to promote progress in science and the useful arts", it is apparent that there is no place in the constitutional scheme for trivial patents. Such patents not only run afoul of the Fifth Amendment, but also bring progress in the useful arts to a standstill and thus defeat the objective of the patent clause itself.

² The "ordinary skill in the art" test was not new in 1851 but represented only a concise expression of the same patentability standard which had been applied from the inception of the patent system. As stated in *Graham, supra*:

"Hotchkiss, by positing the condition that a patentable invention evidence more ingenuity and skill than that possessed by an ordinary mechanic acquainted with the business, merely distinguished between new and useful innovations that were capable of sustaining a patent and those that were not. The Hotchkiss test laid the cornerstone of the judicial evolution suggested by Jefferson..." 383 U.S. at 11.

Section 2 of the 1973 Act provided:

"...And it is hereby enacted and declared, that simply changing the form or the proportions of any machine, or composition of matter, in any degree, shall not be deemed a discovery."

Exclusive patent rights are constitutionally reserved for the truly creative and unexpected advances by which progress in the useful arts is clearly promoted.

B. The Necessary Role of Actual Inventors

One of the substantive changes which has been included in every major patent bill since 1966, including S. 1321 (see §§100(d), 111, 115 and 116), is the provision for the filing of a patent application by the mere assignee of the alleged actual inventor. These provisions substantially depart from present and all prior practice pursuant to which the inventor must make oath or solemn declaration to his personal inventorship of the disclosed and claimed subject matter at the time of filing the application.

There has always been some question among lawyers as to whether the provisions for assignee filing are constitutional. Though carefully drawn to require inventor identification and an inventor's oath before the application issues and hence to preserve some surface gloss consistent with the mandate of the constitutional patent clause that congressional power to establish a patent system is limited in that the patent right may be secured only to "inventors", these provisions have all raised some significant problems.

In the first place, opportunity for gross error in the original specification is enlarged exponentially in a system where the true inventor does not read the description of his invention until after his application is on file. Since S. 1321 [Sections 120(c); 132(d); and 201(a)] is properly consistent with present law in stringently prohibiting an applicant from introducing "new matter"—i.e., matter that was extrinsic to the original disclosure—and at the same time retaining his original filing date, whole new problem areas must be anticipated if assignee filing is adopted. Thus, in some cases, an application filing date may be lost because the inventor finds the original disclosure incorrect and inconsistent with what he in fact originated. In others, the inventor may refuse to make oath to an application inconsistent with what he did, and the result may be litigation between assignee and inventor. Other inventors, though knowing the application describes subject matter they did not invent, may make perjured oaths rather than battle with the assignee—thus rendering the patent invalid as a matter of law.

In this connection, it should be noted that assignee filing as proposed in Recommendation V of the 1966 Report of the President's Commission on the Patent System was designed only to complement the since wholly rejected first-to-file provision of Recommendation I—and both were implicitly a part of the Commission's overall objective of attaining greater uniformity and compatibility with the patent systems of other major industrial countries.²⁹ It is reasonable to assume that the Commission members had in mind a frequent European plaint that the need to obtain the inventor's signature before filing sometimes occasions such delay in filing a United States counterpart to an already filed foreign case that the priority date available under 35 U.S.C. 119 is lost, and that they believed assignee filing would correct this situation. Since the Commission's working papers are not available to the public, it is not known whether the new problems consequent from assignee filing were considered at all—and it is to be doubted that the effects of assignee filing independent of a first-to-file system were ever assessed.

From the very problems that are immediately implicit in assignee filing, it is apparent that adoption of this expedient would necessarily invert the importance of inventors (assignees) and inventors in the statutory scheme.

²⁹The Commission particularly said as to assignee filing, *inter alia*, that

"The present patent act requires (with specified exceptions) that the inventor, at the time of filing, must sign the application and make an oath or declaration that he made the invention. Occasionally, inventors are unavailable or unwilling to sign an application immediately after it is prepared. Moreover, it is sometimes difficult to determine the identity of an inventor at the time the application is prepared. Delay in complying with the requirements has resulted in loss of rights to the application owner. Such delay would be more serious when the effective filing date is treated as the date of invention.

"The intent of this recommendation is to simplify the formalities for filing an application by allowing the owner of the patent rights to sign and file the necessary papers. Many detrimental delays thus would be avoided.

"Before publication of the application, however, the assignee must provide both a declaration of originality and a specific assignment from the inventor to safeguard the interests of the inventor and the public..." (pp. 14-15).

From henceforward the investor would dictate even the subject matter to be covered and the inventor, unless he were exceedingly strong willed or independently wealthy, would be at the economic mercy of the unscrupulous investor. Moreover, a particularly pernicious provision originally embodied in S. 643 has been perpetuated in S. 1321—to wit, §116(b), which on its face sounds innocuous and even efficient, but would actually result in undermining the inventor's importance and denigrating the concept of prior art as expressed in Sections 102 and 103 of S. 1321, consistently with statutes extending back to 1790 and precedent that finds support in the writings of Thomas Jefferson, first administrator of the patent system under the 1790 Act.

Specifically, Section 116(b) provides that where an application names more than one inventor "it shall not be necessary for each person named as an inventor to be a joint inventor of the subject matter asserted in any claim". Present law requires that all claimed subject matter in a given patent application be invented by all named inventors and implicitly requires that subject matter not commonly invented by all of them be presented in a separate application. As so presented and claimed in a *separate* application having a different inventive entity, this subject matter is then independently evaluated under 35 U.S.C. 102 and 103, *inter alia*, for novelty and unobviousness over prior filed applications of other inventive entities within the same research team. As acknowledged in an article appearing in the August 1973 issue of the *Journal of the Patent Office Society*,²⁰

"Our law has previously been based on the concept of individual inventorship. Consequently the law at present recognizes ownership by an employer only after identification of a particular inventor or group of inventors. In the case of major research programs requiring team effort of a number of people this means that the total accomplishment generally has to be divided up into parts each associated with a specified inventor or group of inventors. Patentability of the ultimate achievement of the team is then not based on its [overall] importance and unobviousness, but on a decision as to whether any particular part of it was obvious from the last preceding step made by a different individual member of the team." (p. 520)

This actual practice under present law gives the public an immediate free right to use those steps which represent trivial advances. It is the only practice consistent with the mandate of the Constitution "to promote progress in science and useful arts" by conferring exclusive rights upon inventors.

What §116(b) would do is to permit a monopoly over all the fruits of a research project in one giant multclaim patent filed by the corporate assignee, with all team members named as its "inventors" even though some may have participated in inventing the subject matter of only one claim directed to subject matter obvious relative to the first step advance.

The result of §116(b)—a result greatly desired by those who would *sub silentio* rewrite the constitutional patent clause to substitute "investor" for "inventor"—would be to afford to corporate research teams far more comprehensive patent coverage than an individual inventor could hope to obtain and to divest the public of the immediate right to free use of trivial or obvious advances over the invention covered by a basic patent. The individual inventor will be particularly prejudiced because his work at each step of a development would continue to be evaluated under Sections 102 and 103 against all prior art, including his competitors' interim improvements upon his basic patent. The corporate research team, on the other hand, will be able to immunize individual parts of its work from rejection over earlier completed parts and at the same time to blanket the whole field with a patent. Not only would business be enabled to monopolize great chunks of technology in a way and to an extent not permitted by present law, but a premium would be placed upon the size of the corporate investment and resultant research team in direct derogation of the constitutionally paramount public purpose of the patent laws.

In short, the provisions for assignee filing open a veritable Pandora's box of complex and difficult problems having constitutional ramifications. The entire subject should be carefully reevaluated, particularly insofar as it is inclusive of a proposed provision of the ilk of Section 116(b).

²⁰ H. Meyer, " 'Obvious' Differences—What Should the Points of Reference Be?", Vol. 55, No. 8, *J. Pat. Off. Soc'y* (1973), p. 516.

IV. CONSIDERATION OF SPECIFIC SECTIONS OF S. 1321

The preceding portions of this statement afford a proper context in which to consider the specific sections of S. 1321 particularly at issue at these hearings. It is believed self-evident that all of these sections substantially as presently articulated are essential if the patent system is to function in a manner consistent with its only legitimate purpose.

A. The Public Counsel

For the first time in the history of the patent system, S. 1321 would provide for an independent "public counsel" expressly charged with the responsibility for insuring that "high quality patents which meet the statutory and constitutional criteria therefor issue from the Patent Office". In the past there has been no individual with such a responsibility—and the agency product has been poor. The present Patent Office Solicitor performs no similar function, is answerable to the Commissioner and the Commerce Department rather than the public, adheres to the false philosophy of the Patent Office and has the duty of total defense of whatever position, right or wrong, the agency may take on any issue. Only through the mechanism of an independent advocate free from the restraint presently imposed by the Commerce Department and the organized bar upon the Patent Office can it be insured that only constitutionally acceptable patent monopolies are granted. A particularly important provision of S. 1321 authorizes the public counsel to intervene at his own discretion at any stage of any Patent Office proceeding. It should be recognized at once that any limitation upon this discretion would defeat the primary purpose of the public counsel. For example, should the latter be permitted to intervene only when called upon by the Commissioner or an examiner to do so, the very evils which it is the purpose of these provisions of S. 1321 to correct would continue unabated.

B. The Establishment of the Patent Office As An Independent Agency

The establishment of the Patent Office as an independent agency is essential to preclude the present undue and unacceptable influence of the business oriented Department of Commerce upon the Patent Office function. Indeed, the establishment of the Patent Office as an independent agency strongly militates in favor of the adoption by the agency of a public interest oriented stance and thereby complements the proposal for establishment of the office of public counsel within the agency. In addition, independence of the agency may serve to promote greater stability in the administration of the agency—and, it is to be hoped, in attracting an administrator from outside the patent field who has no bias for or commitment to the present patent lobby.

C. Public Adversary Proceedings

S. 1321 wisely provides for public adversary proceedings consequent from the intervention of any interested party at any stage of any Patent Office proceeding. By this means the ex parte secret solicitation of private patent monopolies is terminated. For the first time the public can be assured of its right to be heard prior to the grant of any patent which purports to compromise its rights. These provisions, however, will be meaningful only if the salutary complementary provisions of §122 which guarantee the prompt public availability of all patent applications are concurrently enacted.

Public adversary proceedings only after an initial agency decision of allowability would be of minimal value if any; the agency having made its determination of patentability cannot reasonably be expected to change its position at the behest of a third party. As any experienced lawyer knows, an attempt to induce a judicial or quasijudicial body to change a decision it has already made is an uphill struggle with only a small chance of success. The only real result of such an endeavor in the Patent Office would be prejudicial to the public in that the tenuous presumption of validity under Section 282 of the statute would be reinforced because the Patent Office would have "considered" and made public record the opposer's prior art references, evidence and arguments. In short, the predictable net consequence of an adversary proceeding only after a primary agency determination of patentability would be to aggravate the burden on already overworked courts in patent cases by artificially reinforcing the statutory presumption of validity of what are all too frequent worthless patents.

D. The Provision for a System of Deferred Examination

Clearly, a deferred examination system reduces the burden upon the agency because, under such a system, many applications will never require full Patent Office examination. As a result, the examiners will be placed in a position to make a proper and thorough evaluation of the lesser number of applications which must be fully considered.

A vital part of the opposite provisions, moreover, permits "any party, or any other person" to make a request for an examination of any deferred application. The reason for this provision was well expressed in Section 9 of the Report of the President's Commission, i.e., that "3. By requesting examination, a potential infringer or other interested party could receive a relatively prompt determination of the invention's patentability" (p. 21). When this opportunity is coupled with the concurrently afforded opportunity to intervene and participate in the patentability proceeding, any member of the public will have a chance, under S. 1321, to obtain a prompt and inexpensive disposition of potential infringement liability.

E. Maintenance Fees

Maintenance fees are a common characteristic of most European patent systems, and are long overdue as a part of the United States patent system.

Patent applicants are a favored class who secure private monopolies from an agency only partially supported by fees which the applicants pay. Patent owners enjoy favorable income tax provisions having virtually no counterpart for other property owners in the Internal Revenue Code. Thus, for example, Section 1235 of the Internal Revenue Code permits a patent owner to purportedly transfer "title" to a patent or patent application, collect "payments" in the nature of a running royalty for the transfer determined annually and spaced throughout the life of the patent—and yet treat the entirety of this periodic income as a capital gain.

It is common knowledge that the royalty income from United States patent licenses amounts to tens of millions of dollars annually. There is simply no reason why the beneficiaries of this income should not pay maintenance fees sufficient at least to render self-supporting the administrative agency which spawns the monopolies by which the royalties are secured.

In addition, setting the maintenance fees at a high level benefits the public by encouraging relinquishment of patent rights to free public enjoyment at an early date well in advance of the statutory expiration date.

STATEMENT OF EDWARD S. IRONS, LAWYER, WASHINGTON, D.C.

Mr. IRONS. Mr. Chairman, we find—I find the bill S. 1321 to be unique and to be refreshingly different. It is, I think, the first patent reform legislation which has been introduced into the Congress in recent history which approaches the problem from the point of view of the public and seeks to correct the situation by procedural and by substantive law which is consistent with the constitutional standard for patentable inventions which underlies the patent system.

The problem to which I have made reference is the basic and fundamental problem that three-fourths or more of all patents which are issued are invalid, and those are only the ones that are litigated. If they were all litigated, I think the percentage would be much more.

There is a striking contrast to the approach which is adopted in S. 1321, which is to somehow, in fact, reform the system so that it serves its constitutional and public purpose. There is a striking contrast with that salutary objective to be found in legislation such as S. 643 of the last session of Congress and other legislation which reflects the basic view of the organized patent bar and of patent owners.

We have a problem, Mr. Chairman. The problem is that too many patents are invalid. There are two ways, basically, in which a solution to this problem can be approached. One of them is to change the procedures and the substantive philosophy in the Patent Office in the way the Supreme Court has repeatedly admonished to get the Patent Office product to a quality level such that it will pass the muster.

The other way—and this is what is in the text of S. 643 and, I am sure, its counterparts that will be introduced by the APLA and others—the other way is to attempt by legislative fiat to lower the standard of—at least statutorily—patentable subject matter so that virtually anything that you file the application on matures into a private monopoly.

This is, then, the issue. Are we going to make the Patent Office conform to the Constitution, or are we going to try to legislatively permit the Patent Office to ignore it, perhaps leaving it up to the courts once more to say, no, you cannot do that?

Behind this is perhaps an even more fundamental question. That is, whether the public interest really is at the heart of the patent system, or whether it is not, whether there is a different interest—the different interest being the one espoused by S. 643 and, I am sure, the APLA bill. It is, bluntly, whether the patent system should be some form of a public subsidy for corporate or private research. This is the issue that is before this committee and the Congress in these bills.

Every objection that you have heard to the specific provisions which this hearing is concerned with is in the direction of denigration of the quality of the patent product and not of improving it. S. 643—I have not seen the bill the APLA is putting in, but I do not have any reason to think it would be any different, because of the philosophy of the people who wrote it—these are not reform bills at all in the sense of a constructive, meaningful reform designed to really improve the quality of the Patent Office product.

These are bills that say, well, we know we have a problem. Let's give some kind of lip service to change, but let's maintain the status quo. And while we are maintaining the status quo, let's do some other things which we have wanted to do for a long time, among these being, for example, amending section 103 to make more things patentable, permitting the filing of applications not by inventors but by assignees, and a host of other things that I will not enumerate now.

Consistent with the procedures which were outlined, I am going to restrict my comments specifically to the five items in the bill which are before us this morning. I want to start out by observing that there are two. I think—at least two—common contentions which crosscut the opposition to meaningful reform. They cut across probably all five of these issues, and I am going to make a brief comment as to both of them.

The first one is this question of secrecy. What is going on in the Patent Office at the present time is the secret *ex parte* proceedings that result in private monopoly. No one has a right to be heard until the patent is issued. This practice, this secret, *ex parte* solicitation of patents, is at the heart of why so many patents are invalid. There is

not any other system in our government which will make an award to anyone against the public interest on a secret proceeding.

What is the reason why you are told that patent applications should be maintained in secret? The reason why is—and it has never been expressed literally—the reason, the underlying reason is that there is supposed to be some kind of a right which inheres in the owner of a patent application to make an election. He is supposed to have a right to elect, even at public expense, in prosecuting a patent application to carry it up clear through the administrative process and then make a decision as to whether or not he can still keep his secret or whether it has to be made available to the public.

Certainly, this may be nice for the patent applicants, because they can preserve what they call trade secrets in this fashion. But it is anti-thetical not only to the public interest generally but to the fundamental premise on which the patent law rests, which is that unpatentable ideas should be freely circulated.

But the problem is more difficult than that. The consequence of the fact that the Patent Office does not publish patent applications is twofold. First, the examiners themselves may not use these unpublished patent applications as prior art. The result is that the prior art criteria against which the question of patentable invention is to be judged, a large part of it is suppressed in the Patent Office and never used. It is also suppressed from the public.

You have heard this morning some kind of a backhanded justification for this. It is said that none of these patent applications that are not published and are abandoned disclose anything worthwhile anyway. If this is true, why is there this great campaign to keep them secret; if there is nothing in them that has any practical value at all, there is no reason why they should not be available, and should not be used by the Patent Office and the public as a part of the prior art to assure that only valid patents are issued. There is no legal or logical justification for this secrecy concept.

It has its foundations in certain elements of State law which define trade secrets. But we all know, and we are constantly reminded, Federal patent policy is supreme. And I think it reaches an absurdity when the Patent Office disables itself to do its job by imposing rules of secrecy which disqualify prior art.

There certainly is no reason why the applicant, having the benefit of a publicly financed examination, should not have his application published at once.

This brings me to the next point. There has been some concession to adversary proceedings. It is said these adversary proceedings should not be indulged until after the patent application is through the examination process and is published. The real reason behind this, I think, is not the one that was expressed, but it is, again, the secrecy problem.

I have spent many years at the patent bar. I have some limited amount of experience in practice before the Patent Office. The Patent Office is no different than any other judicial or quasi-judicial body. Once it has made up its mind that something is patentable and has indicated its intention to grant a patent on it, the net consequence—and there are practical occasions when you can do this, such as in interferences—going to the Patent Office and saying, here is some prior

art and please change your mind and hold this claim unpatentable—the net consequence of this usually is that the prior art is made of record. The claim is still allowed and the presumption of the validity under section 282 is increased, and we have just one more patent for the courts to struggle with.

If there is going to be any practical, meaningful, useful adversary proceeding it must be under circumstances such that the public and the public counsel of the Patent Office can participate in this proceeding from the outset, not after the situation has been crystallized and you have to convince the office to change its mind.

This, in turn, is related to the Office of Public Counsel itself. I think that there may be some kind of a time limit on the practical need for this thing—this thing being the Public Counsel or this type of administration. It may also be related to whether or not the Patent Office is an independent agency. But, so long as it is within the Department of Commerce, and bearing in mind that for 135 years more or less, we have had an *ex parte* secret proceeding with its own ingrown problems, and bearing in mind that the present Solicitor of the Patent Office must, at all costs, defend the Patent Office position, right or wrong, and is necessarily committed to the propriety of the secret *ex parte* proceedings, it seems to me perfectly clear that the only way in which we can bring in a breath of fresh air and openness and a real determination to be sure that the product of the Patent Office meets the constitutional standard is, at least for a time, to get a new officer, a new lawyer, in fact, a public counsel just like, Mr. Chairman, your bill proposes.

I think this is vital. I think that all of these proposals that have been on the agenda today are vital. I think this is a particularly important one.

If the Patent Office is removed from the Department of Commerce and is created as an independent agency, then the Solicitor may well have the degree of independence that is consistent with doing the job, which I do not think he does now.

As Mr. Schuyler said, the Department of Commerce never brought pressure on him, as I understood it and the record will show, to do anything in connection with a certain, specific application. I am quite sure this is true. I do not have any implications to the contrary.

It is also true, and it is common knowledge, that, philosophically, the concepts of what should be the standard of invention and the concept of what should be prior art—these are matters upon which the Department of Commerce itself thinks—and it is common knowledge that these are matters—these policy matters are things that the Department of Commerce seeks to impress its views upon the Patent Office with respect to. I do not think there is any reasonable argument about it.

And the Department of Commerce, quite legitimately, is the voice of business in the administration. I think the Patent Office has to be taken out of this influence and established as its own independent agency, where it can do its job for the public, which is the only constitutional justification for its existence.

I want to touch just in passing on the question of deferred examination, because I think that some of the things that I have already stated deal with it. But the problem which—the objections have been

made here this morning on several occasions to defer real examination is—this came up in countries where there was a backlog, and we do not have a backlog any more.

Why do we not have a backlog?

The reason why we do not have a backlog is, the Patent Office is turning out hordes of invalid patents without due consideration to their legitimacy. It is more interested in quantity than it is in quality. That is how the backlog was reduced.

In the 1971 annual report of the Commissioner of Patents, he speaks with pride. It says that, "New records were again established." They were, indeed. There were more disposals in the Patent Office—I guess there was a new record in 1971—than there were before, and there are more invalid patents than there were before. And there is burden on the public and the courts as a consequence of it.

I have spent a great deal of my time in the Federal courts litigating patents. Everybody outside of the patent system, lawyers in other branches of the profession, Federal judges, economists—everyone who looks at this system as it is presently constituted is absolutely aghast at the way it is organized and run.

It is time, Mr. Chairman, for a real reform. I do not think S. 1321 is necessarily perfect, but philosophically, it is directionally right. The five things that are on the agenda today are all necessary things.

The argument about maintenance fees, I think, is patently specious. In truth, patent applicants are not paying anywhere near what they ought to be paying for the monopolies and the services that they are getting out of the Patent Office. They collect millions of dollars of royalties. They want to have an examination which admittedly is to their benefit, but they still want to keep the unsuccessful applications secret. They have a tax break that no one else has anything close to in section 1235 of the Internal Revenue Act, which permits them to purportedly sell a patent and collect the income from it over the whole term of the patent and treat it as a capital gain.

These patent applicants and patent owners are a very favored group of people, and it certainly is not unreasonable to expect them to pay the cost of those aspects of the administrative process which result in the patents which they impress upon the public to collect millions of dollars of royalties annually.

Mr. Brennan read Mr. Schuyler two statements out of my prepared statement. One of them had to do with the fact that the office of Commissioner of Patents was a political plum. The answer was in the context of how much Mr. Schuyler lost in his service as commissioner for a few years.

It is common knowledge in the context of other than pure dollars and cents income, first, that the office of Commissioner of Patents is a political office. It changes with the administration. It is also common knowledge that many patent lawyers aspire to it and want it.

I do not want to get into personalities or any implications of that kind. But the fact is that these patent lawyers leave their law firms. They go, become Commissioner of Patents for a few years. They go back to law firms. There must be some advantage to it, or they would not volunteer for it. It is also an undisputed fact that the office is a political office.

The quality of patentable inventions is certainly not measured by the number of applications that are allowed. It is measured by the quality of the patent claims which are granted. I am in no position this morning to go into a lot of detailed statistics. But I live in this profession, and I have lived in it for many years. And I have young men that work for me and practice before the Patent Office every day. It is their experience, it is the experience of a great many—a number of people—as reported in books and publications, some of which are quoted in my statement.

As I have said before, the emphasis is now on quantity, it is not on quality. Anybody can get a patent on virtually everything that is novel. It is a shocking thing.

I stand absolutely, without hesitation, upon the statements that I have made in my paper, because I believe them to be correct.

That finishes my statement, Mr. Chairman.

Senator HART. Thank you very much, Mr. Irons.

I assume you are a member of the Patent Law Association?

Mr. IRONS. I am not a member of the American Patent Law Association. No, sir. I was at one time.

Senator HART. I was just going to say it was an interesting convention if you were there.

I will address this to you, Mr. Irons, but if there are others, including those that preceded you, who want to respond, we will receive it for the record.

Again, as a layman, and acknowledging that you can play games with any set of figures, but this business of a rather high percentage of patents which on litigation have been found to be improperly granted or invalid, that percentage added to the very blunt expressions by Federal judges as to the inadequacies of the system, would suggest that we ought to seek to improve its performance, but one could not rely to a very great extent on the work product, the end decision.

Here is the question, and I will be glad to get answers from everybody.

If I were a businessman and one of my great desires was to be a—was predictability, why does not the business community, particularly those companies that seek and get patents, sound off more clearly as to the unsatisfactory end product of the present patent system? Specifically, why do they not say, how the hell can I commit x dollars for an exploitation, when I read Federal judges saying a high percentage of the paper is not worth the cost of the paper itself?

Mr. IRONS. Mr. Chairman, you have your finger on the real issue which is before you, and I respectfully suggest that these businessmen and through their patent attorneys, are screaming, and loudly. You have probably seen it in papers that have been submitted to you. There is a crisis in the patent system. We cannot predict with any confidence whether our patents are going to be sustained or not. We hear judges condemn them. Something must be done about it. The Congress must do something about it.

The problem is, there is commonality in viewpoint that something must be done about it, and believe me, Senator Hart, the business community, at least through their patent groups, are very vocal

about this. But the problem is one of approach. They say, all of the courts are wrong; all of the economists are wrong; all of the people that are in the colleges, and the professors are wrong. There is not any constitutional standard of invention. Give us predictability by writing into the statute that we can get a patent on virtually everything, that we can license it under any kind of conditions we want to, and in other words, subsidize our research effort.

The plea is there, sir. Do not misunderstand me. I want to be very clear. There is considerable agitation, large amounts of agitation in the business community over this very predictable factor. The controversy is how to solve it. The business community wants to solve it basically when you get them down to it, by lowering the standard of invention. All of these things we have discussed this morning in one way or another relate to that.

Senator HART. Mr. Brennan.

Mr. BRENNAN. Mr. Irons, what would be the impact of a public adversary proceeding on a small independent inventor?

Mr. IRONS. I do not understand that it would have any more serious impact upon him than anyone else. He would simply have to justify to the Patent Office in the context of the advisory proceeding that he was entitled to the monopoly that he requested.

I suppose that your question is in the context of could he afford it.

Mr. BRENNAN. Indeed.

Mr. IRONS. I simply suggest to you, Mr. Brennan, that anybody that seeks a monopoly from the public, cannot complain if he is required to advance sufficient funds to demonstrate that he is entitled to it.

Mr. BRENNAN. As you conceive the role of the public counsel, how many additional employees would be required to perform those duties?

Mr. IRONS. I have not thought in terms of specifically how many employees it would require to perform those duties, but I completely disagree with the suggestion that it would require another examining corps. The public counsel, as I read S. 1321, is given to discretion to select those cases that he wants to intervene. He is not required to intervene in all of them.

Mr. BRENNAN. What criteria would be applied in exercising this discretion?

Mr. IRONS. That, too, is not decided in the bill, but both you and I know. Mr. Brennan, because you have been many years with this subcommittee, there are patents of major importance that dominate all industry, and there are patents of lesser importance. I would think one criteria would be a patent that promised to dominate an industry might be worthy of particular attention. I should think another time when the public counsel might have particular concern would be if there is any suggestion of impropriety. I am not using the word fraud, but I intend to include it, some form of inequitable conduct on the behalf of the person soliciting the patent.

Mr. BRENNAN. Do you see any constitutional problems if one application is involved in a more thorough process than that of another applicant?

Mr. IRONS. No.

Mr. BRENNAN. You spoke of the hordes of invalid patents that have been pouring out of the Patent Office in recent years.

Is this reflected in a rise in the number of litigated patents which are found to be invalid in the Federal courts?

Mr. IRONS. If you think, at least from the late 1940's until the present time, I would say yes. It depends on the timeframe.

Mr. BRENNAN. Your testimony, I think, was directed primarily to the last 4 or 5 years.

Mr. IRONS. The percentage of patents invalidated in the last 4 or 5 years, I do not know precisely.

Mr. BRENNAN. You have no evidence to support your statement that hordes of invalid patents are pouring out of the Patent Office?

Mr. IRONS. I do not have evidence at my fingertips. The statistics, for example, is in the Office of Publications of the Administrative Office of the Federal courts, for example.

Mr. BRENNAN. Would you be willing to supply for the record any evidence that you have that the percentage of invalid patents has appreciably increased in recent years?

Mr. IRONS. I will supply such statistics as there are.

I am interested in your questions. I have not noticed a request for supply of any evidence to support statements such as, if secrecy were abolished there would be less patent applications, or any evidence to support the suggestion that the abandoned patent applications do not disclose anything worthwhile, or any evidence to support the proposition that a great percentage of the fees of the Patent Office are really for the benefit of the public.

Yes, I would be delighted to give you the evidence you ask for, but I think the evidence, the evidentiary matter is at the heart of the problem, in Senator McClellan's bill and this bill. This committee is being rushed in an atmosphere of crisis into legislation without any adequate evidentiary base.

I think your point is very well taken. I would like to call your attention to the fact that there is funded to the tune of several million dollars, somewhere in the area of \$2 million or \$3 million at least, in the National Science Foundation, studies that are proceeding today that will afford the Congress a factual basis on which to make the decision that it is being asked to make an assumption.

Mr. BRENNAN. Thank you.

No further questions.

Senator HART. Mr. Irons, thank you for your testimony.

[The information referred to earlier follows:]

SUPPLEMENTAL STATEMENT OF EDWARD S. IRONS

Submitted herewith as Exhibit 1 for inclusion in the record is a copy of a graph which appeared in the Patent, Trademark and Copyright Journal published by the Bureau of National Affairs on September 13, 1973. This graph not only compares patent costs in several of the world's leading industrial countries but it contrasts the statistics on patents granted as compared to patents applied for in a plurality of countries. The teaching of the graph is, inter alia, that West Germany and Japan, countries many observers believe to be outstripping the United States in productive research and development as well as in the commercial application of new technology, are granting a significantly smaller proportion of patents based on applications filed than is the United States. More specifically, this graph demonstrates that West Germany grants somewhat less than 20,000 patents for

each 65,000 applications filed, while Japan grants in the order of 40,000 patents per 100,000 applications. In other words, both of those countries have a high standard of patentability which is apparently strictly enforced at the Patent Office level. By contrast, the graph shows that the United States Patent Office grants approximately 75,000 to 80,000 patents per 100,000 applications filed. Notably, the Patent Office in West Germany is a strong and independent agency in no sense controlled by any particular executive department of the government. In addition, both countries have viable inter partes opposition proceedings in which public participation is strongly encouraged. These statistics constitute some of the most objective evidence available at this time to demonstrate that a low standard of patentability and a concomitant high rate of issuance of patent applications are (a) unnecessary to stimulate either research per se or investment in research and development and (b) actually act as a brake upon real technological progress. These statistics also seem clearly to indicate that, at least in Japan and West Germany, insistence upon a high standard of patentability has acted as a spur to both invention and investment. It is instructive to note that the article accompanying the graph observes that under the German-Dutch type of patent system "patents are hard to get but hard to challenge, once obtained".

We in the United States, of course, have the reverse situation—i.e., patents are easy to get and easy (albeit expensive) to challenge. The fact that a high proportion of patents litigated are held invalid in our courts has long been recognized. While statistics on patent validity adjudications in our courts vary from one time period to another, the most recent reasonably accurate compilation of statistics known to me appear in Kayton, *The Crisis of Law in Patents*, Pt. I, p. 5, and Appendix 2, pp. 13 to 14 (Patent Resources Group, Wash., D.C., 1970). Other statistics possibly available to Subcommittee members as of September 11 were published in the Patent, Trademark & Copyright Journal of the Bureau of National Affairs for September 13, 1973 at pages F1 and F2. These latter statistics were assertedly compiled by the Patent Office and cover the years 1968 to 1972, inclusive. They purport to show that only 50% of patents litigated in the federal courts during that time span were held invalid. These Patent Office statistics are subject to severe criticism because they include nonappealed and non-reported judgments of district courts which may in a large proportion of cases yet be appealed and result in validity decisions or which may have resulted in settlement favorable to the opposing party after the district court judgment because the patentee knew, after seeing his opponent's case that the district court would surely be reversed on appeal. Interestingly, these statistics, if properly confined to final decisions of the courts of appeals, are acknowledged by the Journal to demonstrate that approximately 70% of patents litigated in the 1968-1972 period were found invalid and hence to be consistent with the Kayton statistics. A further criticism can validly be made of the Patent Office statistics because of their inclusion of results from the Court of Claims, a court having relatively little incentive to hold patents invalid because the party opposing the patents before it is always the United States Government—and the Government is often understandably reluctant to press vigorously for a holding of invalidity of a patent it duly granted.

It should further be noted that there are no statistics yet available on court adjudications of patents issued within the last five or six years. There is in general a time lag between the issuance of a patent and its adjudication in any court even in instances where litigation is instituted promptly upon the issuance of the patent. In many cases, litigation does not ensue until the patent is several years into its term. The result is that any effort to determine the fate in the courts of patents issued by the Patent Office in the last five years must necessarily be postponed at least another five years and perhaps longer in order for sufficient adjudications to have been made to permit any meaningful statistics. It is fair to say, however, that I have noted in the course of my own work for my own clients that the quality of the Patent Office product is steadily deteriorating and I have found in conversations with patent lawyer colleagues from other places, including

patent lawyers employed by my corporate clients, that many of them, too, have noted a trend toward issuance of an increasingly greater number of invalid patents consequent from an increasingly lowered standard of invention in the Patent Office. It appears, moreover, from the prepared statements of certain of the witnesses before the Subcommittee, including particularly that of Mr. Milton Weissman, a Patent Office Primary Examiner, and those of the corporate counsel who testified, that this general deterioration in Patent Office application of patentability standards is widely recognized both within and without the Patent Office.

SOME MISCONCEPTIONS ABOUT PATENT APPLICATION SECRECY

The prepared statement of Mr. Thomas E. Kauper, Assistant Attorney General, Antitrust Department, Department of Justice, presented September 12, 1973 asserts that "since the first patent statute,...disclosure to the public has occurred only *after* the Government has issued a patent" (p. 8; emphasis added). The statement then proceeds to question whether the type of opposition proceeding contemplated by S. 1321 which would require an abolition of the secrecy practice should not be modified to a more "balanced" position in which limited secrecy to patent applicants would still be available. In fact, it is not correct that either the first patent statute or any subsequent patent statute prior to 35 U.S.C. 122 of the 1952 Patent Act contained any requirement for secrecy of patent applications at any stage of their prosecution. Quite significantly, Section 12 of the Act of 1836, which for the first time provided for the filing of caveats, decreed that these should be held "in the confidential archives of the Office and preserved in secrecy" but carefully distinguished them from applications as to which no requirement for secrecy was made.¹

There is no indication, moreover, either in the Patent Office rules or elsewhere that any practice of maintaining pending patent applications in secret was adopted until approximately 1850—some 60 years subsequent to the first patent statute. All abandoned patent applications were routinely available to the public pursuant to the Patent Office rules and practice until approximately 1879. At that time, based on *The Corn Planter Case*, 90 U.S. 181 (1874), which held that an abandoned application of earlier date, though prima facie evidence of prior invention and prior inventorship, could be rebutted, the Patent Office ceased to cite abandoned applications as prior art against pending applications and also changed the rule which theretofore had made abandoned applications routinely publicly available.

And even today under 35 U.S.C. 122 disclosure to the public of the subject matter of many patent applications occurs long before the government issues any patent. For example, in many foreign countries the complete text of the United States application upon which a foreign application is based becomes publicly available at or shortly after the date of the foreign filing. Since the United States applicant must file his application in those foreign countries subscribing to the Paris Convention and the Stockholm Revision thereof within one year of the United States application if the benefit of the United States filing date is to be preserved, a very large number of the applications that are filed in the United States Patent Office become public through foreign patent offices within approximately one year of their filing. Certain agencies of the United States Government, e.g., NASA, make their applications publicly available as soon as they are filed, both in the United States and elsewhere. And, of course, the subject matter of United States patent applications is in many cases made publicly available through publication in technical journals and the like or through public use and sale of the subject matter embodied therein. In short, the protestation, though frequently heard, that all pending patent applications are required to be held in secrecy until the issuance of a patent is simply incorrect even

¹ A caveat is essentially a written description of an invention filed with the Patent Office for the purpose of establishing that the inventor was in possession of the idea therein expressed by the date that it bears. Such documents do not, and did not in 1836, have the status of patent applications. Under the 1836 Act, the caveat was held in secret until the filing of the application, but no statutory restraint was placed upon the publication of the application.

today in the face of 35 U.S.C. 122, the first statute to affirmatively authorize such secrecy. Indeed, it takes a very agile patent applicant to maintain the subject matter of his patent application a total secret prior to its issuance.

35 U.S.C. 122 when enacted in 1952 was represented to Congress to be a codification of a long standing Patent Office rule. Thus, the Reviser's Note accompanying the statute at the time of its enactment states:

"This section enacts the Patent Office rule of secrecy of applications."

Along the same vein, Mr. P. J. Federico's commentary on the 1952 Patent Act says of 35 U.S.C. 122 that

"Section 122 is a new section which enacts as part of the statute the rule of secrecy of patent applications which has been in the Patent Office rules in one form or another for about a hundred years...."

In fact, the purpose of Section 122 was not really to codify an agency practice—though this may have been incidentally accomplished—but sub silentio to lend an aura of statutory authority to a false theory that grew up at some indeterminate time between 1870 and 1952.

In his book, "The Supreme Court and the Administrative Agencies", The Free Press, N.Y. (1968), Martin Shapiro has devoted some 84 pages to the subject of "The Supreme Court and the Patent Office". Of particular interest in the context of the present effort to modernize the patent laws are the revealing subsections (pp. 204-213) relating to the Patent Act of 1952 and the manner in which it was formulated and enacted, a copy of which is appended as Exhibit 2. This material demonstrates that the actual drafters of the 1952 Patent Act carefully concealed from the Congress the basic intent underlying many of the provisions written into the statute and in due course adopted by Congress with wholly different intent in view, without knowledge of the drafters' real purpose or the pertinent facts.

35 U.S.C. 122 was unquestionably one of the statutory provisions which Congress was induced to enact without knowledge of the underlying intent of the persons who drafted it or the facts pertinent to why it was desired. Since its enactment, 35 U.S.C. 122 has consistently been utilized as the vehicle for imparting a tinge of federal "property right" to so-called "trade secrets" constituting unpatented and unpatentable subject matter. Proponents of trade secret "property rights" argue that the secrecy provision of 35 U.S.C. 122 is intended to afford to the alleged "property" owner an absolute right of trade secret "property" in the subject matter of all abandoned patent applications, and that each patent applicant has the right after he has had his patent application examined at public expense to decide whether it shall be exploited as a trade secret or as a patent. In short, under this theory patent applicants never lose because if they can't qualify for a patent or are dissatisfied with the claims the Patent Office will allow they can abandon their applications and still have monopolies called "trade secrets".

To amplify, it is presently common practice under the state law for the holders of alleged trade secrets to license such trade secrets for running royalty payments to a plurality of competitors. It is not unusual for these running royalty payments to continue in perpetuity or for other arbitrarily selected periods greatly in excess of the statutorily authorized patent term. As will readily be seen, when a so-called "trade secret" is actually shared among all the significant competitors in a field, each of them paying a running "royalty" in exchange for having received a disclosure of the "trade secret" subject matter, the so-called "owner" is in the same position with respect to the enjoyment of a reward extracted from members of the public as if he had obtained a valid patent from the Patent Office. At the same time, he enjoys many advantages that the holder of a valid patent does not in that there is no law of "misuse" of trade secrets and no way in which a trade secret can be invalidated. Moreover, because the trade secret holder chooses the limits of his "trade secret" himself and need not observe the limits of claims granted by the Patent Office, also choose the term of his trade secret himself and hence is not limited by the statutory monopoly term of the patent, and still further chooses those to whom he will "license" the secret, on any basis he wishes without fear of being guilty of patent misuse as a result thereof, he is in effect his own patent office and his

monopoly is in many respects greater than that which the government affords to a legitimate patentee."

That Congress had no such end in view when it enacted 35 U.S.C. 122 is abundantly clear from the legislative history of the 1952 Patent Act including the record of the hearings which preceded the enactment and the Senate and House Reports which accompanied it. Indeed, the entire theory that secrecy in the Patent Office has as its purpose to promote *private* trade secret interests of individual inventors is not only foreign to the spirit and intent of the constitutional patent clause which has a primary public purpose but one which finds no support whatever in any record of any antecedent Congressional deliberation, statute or precedent. Only certain text writers of relatively latter day origin have purported to subscribe in any manner to this theory and even they provide no cogent support for it—as they could not, since none exists.

Retention in the Administration patent bill which first became available to the public on September 27, 1973 of a provision for maintaining patent applications in secret until a notice of allowability is given is, insofar as the organized patent bar is concerned, retention of the tenuous and at no time consciously or directly statutorily sanctioned by Congress "right of election" between a patent monopoly and a trade secret monopoly after the public has paid for an examination.

RELATION OF SECTIONS 122 AND 301 OF THE ADMINISTRATION BILL

The new Administration bill couples its retention of Section 122, essentially unchanged, with a new Section 301 which would effectively legitimize the private trade secret monopoly and give trade secret "owners" carte blanche to victimize the public through spurious private monopolies neither constitutionally sanctioned nor permitted by federal patent law. In particular, subsection (b) of Section 301 purporting to prohibit the states from granting "the right to limit the full and free use by the public of ideas in the public domain or in general circulation" is ambiguous. Strictly construed, it would appear to permit the state to grant some form of "petty patent" or "trade secret" right enforceable against others on any subject matter which could be shown to be novel by virtue of the slightest variation from known subject matter or which would be obvious in relation to "ideas in the public domain or in general circulation". The interplay between Section 122 and Section 301 is such, if enacted, that the two sections will be used to revitalize and reinforce one another and will be argued as constituting a congressional approval of the practice of filing a patent application, obtaining an examination at the expense at least in part of the general public, and then, in the light of the narrow scope of coverage available from the Patent Office, deciding that the subject matter shall be held "secret" for exploitation as a monopoly under state law in accordance with Section 301 rather than permitted to issue as a patent—and this notwithstanding the fact that these matters have never been fully and candidly aired before Congress.

The problem with Sections 122 and 301 of the Administration bill is particularly highlighted by the present pendency before the Supreme Court of a petition for writ of certiorari in No. 73-187, *Kewanee Oil Co. v. Bicron Corp., et al.* The case arises from the Court of Appeals for the Sixth Circuit which held effectively that subject matter which has been exploited by public use and sale for more than one year and hence can no longer qualify for a valid patent may not be protected as a trade secret but must be considered under 35 U.S.C. 102(b) to be within the public domain. The Administration bill as now presented would sub silentio overrule or at least attempt to overrule the *Kewanee* case regardless of how the Supreme Court may deal with it. The objective is to preempt or overrule any Supreme Court decision on the question of whether, in accordance with the previous decision in *Lear v. Adkins*, 395 U.S. 653 (1969), the constitutional patent clause and all the patent laws as heretofore enacted by Congress circumscribe

² Proponents of this argue that because an independent discoverer of the trade secret can use it freely—i.e., one cannot be sued for infringement of a "trade secret"—the trade secret protection is less. It should be recognized that this single disadvantage is outweighed for many would-be monopolists by the significant advantages detailed in text.

the law of private contract relating to trade secrets in essentially the same way that the patent clause and the patent laws since 1790 were found to circumscribe the state law of unfair competition in *Sears, Roebuck & Co. v. Stiffel Co.*, 376 U.S. 225 (1964), and *Compeco Corp. v. Day-Brite Lighting, Inc.*, 376 U.S. 234 (1964). In short, what the Administration bill will accomplish if enacted is, without knowledge by the Congress of all the facts or the real intent, to foreclose decisions which the Supreme Court may make in the future on constitutional grounds. If Congress is now to make judgments upon the leeway to be afforded the states for the protection of trade secrets by private monopolies, then, at the very least, Congress must engage in detailed consideration in the light of full knowledge of what it is accomplishing and must particularly consider what limits the constitutional standard of invention necessarily imposes on such private monopolies. It is submitted, moreover, that Congress should not place a federal legislative imprimatur upon the state law of trade secrets as it now exists, since that law as now extended far beyond the narrow bounds of personal fiduciary relationship upon which it was originally premised and as to which it is still valid, is necessarily in direct conflict with the constitutional patent clause and every patent law enacted by Congress since 1790. In short, there is no clearly demonstrated need or jurisdiction for this sweeping legislation, which has not been fully explained to Congress and has not been the subject of fully focused factual inquiry by the Subcommittee.

The foregoing discussion of Sections 122 and 301 of the Administration bill, first available to the public, including the writer, on September 27, 1973, is not intended to be exhaustive of criticism of the provisions of that bill. Per contra, in the short time that such bill has been available, there has been no opportunity to digest or consider thoroughly any of the others of the provisions it contains. Other provisions, like those especially discussed, may also contain hidden or camouflaged dangers to which the Subcommittee should be alert and hence careful consideration of every provision of the Administration bill is urged.

SPECIFIC COMMENT CONCERNING PARTICULAR SECTIONS OF S. 1321

Many sections of S. 1321 have already been the subject of extensive comment by the writer and by others who have testified. Presumably various sections will also be commented upon in writing by members of the public who did not testify. Particular attention is invited, however, to the following specific subsections which it is believed merit further consideration by the Subcommittee:

Section 119(c).—This section should be reworded to make clear that even though the first filed foreign application has not been "withdrawn, abandoned or disposed of without having been laid open to public inspection and without leaving any rights outstanding", a subsequently filed application in the same foreign country by the same applicant may serve as the basis for a right of priority provided the first application was filed not more than one year before the United States application. Such a provision is consistent with the original Paris Convention and the Stockholm Revision; is consistent with the treatment that United States applications are afforded in foreign countries, and is consistent with the way that the present law is construed, quite properly, by the Patent Office. To exemplify: If the first filed foreign application does not contain sufficient disclosure to satisfy 35 U.S.C. 112 or otherwise fails to satisfy some requirement of United States law but a subsequently filed foreign application is adequate under United States law and a United States application based upon both is filed within a year of the filing date of the first application, the fact that only the second application complies with United States law and hence qualifies under 35 U.S.C. 119 should not prejudice the applicant from obtaining the benefit of his second application. In such a case, moreover, so long as the United States application has been filed within a year of the first filed application, the United States public is in no way hurt by the fact that the earliest priority date available to the applicant is the later date of the second application.

Section 120.—The desirability of perpetuating any form of continuation-in-part application is exceedingly doubtful. One of the most frequent criticisms of the United States patent system I have heard voiced by foreigners is a criticism of the continuation-in-part practice as it now exists. Moreover,

the practice is widely abused both by design and by accident. The practice frequently results in situations where an applicant's United States patent issued from his continuation-in-part application is invalid based on the 35 U.S.C. 102(b) or (d) consequences of his own foreign patent issued on a counterpart to his original United States patent application. If the practice is to be as severely curtailed as it would be if Section 120(a)(4) of S. 1321 were enacted, it will be relatively unavailable to practitioners in any event and extremely cumbersome to deal with. It would seem that total abolition of the practice by deletion of the section might well be the more desirable alternative since it would permit simplification of the practice and would give greater certainty to practitioners in the long run.

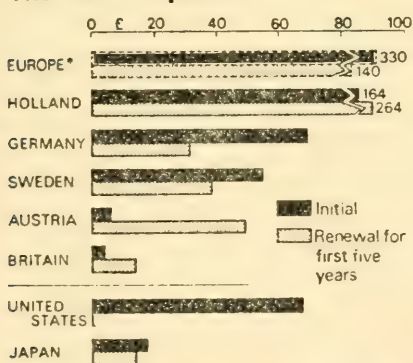
Section 282(c).—This subsection would greatly complicate the presently required statutory notice under 35 U.S.C. 282 required of persons opposing the validity of a patent. In point of fact, the present Section 282 notice is an outmoded throwback to practice under the equity rules as it existed before the Federal Rules of Civil Procedure with their liberal discovery provisions were promulgated for all litigation, including patent litigation. In litigation as it now exists, every litigant (including every patentee) has the right by the use of interrogatories, pretrial depositions and requests for admission to obtain whatever information he may deem necessary relative to the claims which are being made against him including the basis for allegations of invalidity, etc. Because the tendency is toward simplification and not overcomplication of litigation procedures, it would seem more equitable and more appropriate to delete the anachronistic requirement for the 282 notice altogether and to leave to patent litigants the choice of what pretrial discovery to pursue. The trial judge, who presumably will know the facts of the case, will be able better to determine the extent of specific information that it is feasible or useful to require in any given case.

SPECIFIC COMMENT ON THE PROPOSED APLA BILL

This bill, filed as a part of the testimony given September 11 on behalf of the American Patent Law Association, is not really a "reform" or "modernization" bill at all. It fundamentally constitutes a mere rehash of S. 643 with some retrogressive embellishments, e.g., in Sections 102 and 103 designed to make patents easier to obtain and easier to enforce. It has already, in essence, been fully considered and rejected by the Subcommittee and hence does not merit further detailed consideration at this time.

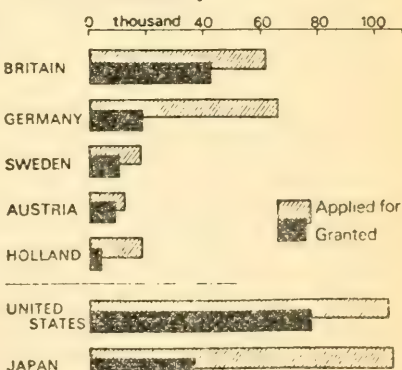
Exhibit 1

The cost of a patent....



*includes estimated printing fees of £9. Initial charges apply to EEC only. £9 must be paid for each extra country nominated.

....and how many¹



¹1971 figures

THE SUPREME COURT AND ADMINISTRATIVE AGENCIES

By Martin Shapiro

THE PATENT ACT OF 1952

From an excursion into the world of litigational bargaining we return to our main story, this time at the year 1952. But the story itself now leads us from Supreme Court and administrative agency to pressure groups and Congress. And again this is not an unusual route peculiar to patent law. Since both court and agency function as supplementary lawmakers under the statute maker, it is hardly surprising that the statute maker sporadically intervenes in the relationships between his two subordinates. It is important to note, however, that such intervention may create a major change in policy, a minor change or, in spite of the passage of a whole new statute, no change at all. In other words, it should not be automatically assumed that the statute maker always makes big policy decisions and the courts and agencies little ones. Each is capable of various levels of intervention in the legal process taken as a whole. The Patent Act of 1952 illustrates an intervention by the statute maker that approaches the zero level.

It is always best to begin the examination of a new statute at the beginning, not with its birth but its conception. By the early 1950s there was a widespread feeling among patent lawyers that the Supreme Court had gone astray and that somehow the good old days as symbolized in the pre-1930 cases had been better and should be revisited. The Patent Office was, of course, both a source and supporter of these sentiments. In 1952 one of those legislative accidents occurred that frequently serve as the catalyst that turns widespread sentiment into concrete political action. Congress was in the process of recodifying the laws of the United States. The U.S. Code is an arrangement in logical sequence of all the laws passed by Congress. But as minor amendments and major changes build up, and are tacked on here and there to the old code, things get more and more confused. Eventually the Congress does a periodic general cleaning and straightening up and then re-enacts its newly ordered arrangement of the laws as a new edition of the U.S. Code. It just so happened that in 1952 the subcommittee of the House Judiciary Committee in charge of going through the entire code and preparing a new edition was the subcommittee which in the normal course of its business, when it wasn't redoing codes, was in charge of proposed patent legislation. So long as the subcommittee had to work over the patent sections of the Code anyway for a new edition—and they badly needed straightening—it might as well take the occasion to improve the law, since that was part of its normal responsibilities—two birds with one stone, so to speak.

At least those forces anxious to undercut the Supreme Court pressed this argument on the members of the subcommittee. They responded favorably and set the subcommittee's professional staff to work on drafting new legislation. The reader will recall that the rather cumbersome term "statute maker" rather than Congress was originally adopted to emphasize that legislation was often a joint product of the executive and legislative branches, not of Congress alone. He should not be surprised to find then that Mr. J. P. Federico, a leading member of the Patent Office bureaucracy, soon appeared as a counsel to the subcommittee—that is, a member of its staff—and was given the central responsibility for drafting the proposed law. There is nothing improper about this. Experts from the agencies are frequently seconded to congressional committees for such work. But in a very real sense the Patent Office wrote the congressional statute of 1952 as part of its continued battle with the Supreme Court.

It had help. The American patent bar is a relatively well-organized group comprehending most of the lawyers who specialize in patent matters, formed into regional associations with a national coordinating hierarchy. As soon as patent law revision was in the wind, this group created a task force of its most prominent leaders to help shape the legislation. This task force became so active in the statute drafting that in the end Mr. Federico did not so much draft legislation *for* a congressional committee as *with* the patent bar. Not only did he and three lawyers officially representing the

organized patent bar do almost all of the drafting, but the drafts were circulated among all the prominent patent lawyers and revised to conform to their desires.

Political scientists have often pointed out that it is incorrect to view congressional lawmaking as necessarily occurring in the context of various pressure groups fighting it out against one another. Very frequently there is only one pressure group in the field at a time, and it fights *for* what it wants but not *against* any particular interest-group opposition. While patent lawyers of course represent infringers as well as patent lawyers in court, the bulk of their services to clients consists of helping them obtain and defend the validity of patents. Quite naturally then they tend to identify the good with more patents rather than fewer, just as does the Patent Office for a different but parallel set of reasons. Thus the Patent Office and the patent bar comprise a powerful, "propatent" pressure group.

Because no group of lawyers and no government agency specializes in fighting against patents, and no particular segment of the business community is uniformly harmed by patents, there is no "antipatent" pressure group. The "antipatent" interest in this country is not specialized or concentrated, but consists only of the general interest shared by all citizens that their government not make a bad bargain for them when selling its stock of limited monopolies. Such amorphous interests are notoriously underrepresented in American politics precisely because no organized group and no specialized government agency speaks for them.³¹ Indeed, it makes considerable sense to view the Supreme Court's role in this area, as in some others,³² as the representation of widespread but unorganized public interests that are not adequately represented in the executive or legislative branches. This may be the major special reason justifying court intervention in this area of policy making.

In any event the propatent forces had a free hand in writing the legislation unopposed by any countervailing group. Of course the congressman on the subcommittee, and then those on the full Judiciary Committee, all of them lawyers, but none particularly expert on patent matters, did review the draft. But they made few changes, and the Committee's report and "Revisor's Notes," which accompanied and explained the bill, were written by Frederico, either independently or in cooperation with the representatives of the patent bar. One of those representatives has proudly answered the question: "Who wrote the patent laws of 1952? We did."

The bill then had to proceed to the floor of the House where theoretically the whole membership considers it before exercising their legislative will. It was brought up on the unanimous-consent calendar, no one objected, and it was passed without debate; the whole proceedings taking perhaps thirty seconds. It then went to the Senate, where the Senate Judiciary Committee made only a few minor changes. The bill failed of unanimous consent on the floor of the Senate, one senator asking the chairman of the Judiciary Committee whether the bill was simply a new codification or made changes in the law, the chairman replying that it was simply a codification. The bill subsequently passed with no further debate.

There is little question that the general membership of Congress had no idea what it had enacted and was left with the impression that it didn't matter anyway, since the bill was simply a recodification of the previously existing law. The peculiar coincidence which started the whole process off had much to do with this. In a normal year, if a patent bill had been brought to the floor everyone would have assumed it meant some change in the existing law. Committees don't devote energy to bringing in new bills that do nothing. But in the year that Congress was re-enacting the whole U.S. Code, and from the subcommittee that was doing all the re-enactment, this bill must have appeared to most congressmen to be simply another in the stream of re-enactments. It would have taken an alert congressman indeed to remember, if he had even known such a minor thing in the first

³¹ The nearest approach in the patent field is the Antitrust Division of the Justice Department which is concerned with patents insofar as their manipulation contributes to violation of the antitrust laws, and quite significantly this agency is the only "antipatent" voice in Washington, besides the Supreme Court itself.

³² See Shapiro, *Freedom of Speech, the Supreme Court and Judicial Review* (1965).

place, that the subcommittee handling recodification of the whole body of law just happened to also be the subcommittee which had special jurisdiction over patents, and then put two and two together to conclude that this particular recodification might not therefore simply be a recodification but a new law. And even if such a congressman had existed, and he had then bothered to get a copy of the bill and read it carefully line by line, another minor miracle in and of itself since few congressmen have time to do this sort of thing, there are so few hints in the language of the statute that it is anything but a recodification. So much of it is precisely that, that only a superalert congressman, fully briefed by someone on what to look for, would have spotted any changes. There was no someone, because there was no antipatent interest group fighting the bill, and there was no superalert congressman.

LEGISLATIVE INTENT

I have not gone into all this just to illustrate the vagaries of Congress but rather to provide some concrete data on which to base a discussion of "legislative intent" which is frequently a key problem in administrative-judicial conflicts, and also because the specific question of whether Congress intended simply to codify previous law or pass new law becomes the principal vehicle for policy debate in the post 1952 period.

It is one of the small ironies of political studies that the principal source of information for our story of the writing of the patent law by an interest group composed of propatent lawyers and bureaucrats, and its consequent passage by a Congress totally unaware of what it was doing, is the reports of one of the drafters, a noted patent lawyer and leader of the propatent forces.³³ And he makes his revelations in order to prove that the legislative intent of the 1952 laws is to liberalize the standard of invention not codify the old law. What he actually proves is that Congress in passing the legislation thought it was passing a simple codification.

Why then does this distinguished lawyer and judge think he is proving the opposite? The answer lies in the several different approaches to legislative intent that typically lead to conflict in the administrative-judicial sphere.

The lawyer almost instinctively treats a statute as a legal document like a contract. Its meaning is to be derived from its plain words, no matter what those who signed it actually intended. When its words are not entirely clear, one looks to the meaning that those who wrote the words intended them to have. The argument in the patent area then becomes clear. *Precisely because* Congress did not know what it was doing when it passed the statute, and *precisely because* the words of the statute are not themselves absolutely clear, the statute means whatever those who drafted it wanted it to mean. Since those who drafted it meant its words to reduce the standard of invention below that used by the Supreme Court, that is the meaning, i.e., the legislative intent, of the statute.

The legal conventions that grew up around the interpretation of contracts are based on a set of circumstances and considerations that are not necessarily applicable to the reading of statutes. Many administrators and judges today prefer not to pretend that a statute is like a contract, but, shifting to direct and realistic political analysis, to ask what did the Congress really want? This question leads to its own difficulties.

Frequently a statute consists of a set of verbal devices used to compromise between various conflicting interests and purposes rather than specifically furthering one interest. Congress in effect avoids choosing between the interests by using words that each can interpret as favorable to it. Indeed different congressmen may have voted for the bill for entirely different reasons, some taking the words one way and some another. Realistic political analysis lies not in trying to discover the "true" meaning of such a law, but in taking it as a command by the statute maker to its administrative and judicial subordinates to work out on their own initiative a compromise satisfactory to the interests at play.

Alternatively it may be discovered that Congress as a whole had no intention, in the sense that it was simply approving what one of its

³³ See Rich, "Congressional Intent—Or Who Wrote the Patent Act of 1952?" in *Patent Procurement and Exploitation* 61-78 (1963).

committees had done, trusting its committee to have done the right thing. Most congressmen rely heavily on the judgment of the committees and their votes on a bill frequently mean: whatever the committee wanted, it should get. Where this is true judges and administrators will turn heavily to committee reports and statements of committee members as evidence of what the statute meant.

Even when congressmen wish to exercise an independent judgment, they will often make committee reports and committee members' statements the principal basis for those judgments. So here again realistic analysis will rely heavily on such materials to determine what the congressmen thought they were doing when they voted yes. For example when a committee report explains that a bill will do *X*, there is strong reason to believe that most of the congressmen voting for it wanted *X* done. The more technical and remote from their major concerns a given bill is, of course, the more reliance congressmen will place on committee information and consequently the more that information reveals what they thought they were getting when they voted aye.

Thus administrators and judges in determining legislative intent are likely to attempt to trace the actual process of decision making in Congress, giving great weight to those materials which give evidence of what the congressmen actually thought they were doing. Frequently such analysis will lead to the conclusion that Congress collectively had no single purpose and that a law was passed by a coalition of congressmen each wanting different things. Since there is no unified legislative intent in such instances, the administrator or judge is free to do—indeed has to do—what he pleases within the broad limits set by the coalition. He will, of course, then pick and choose among the materials of the legislative history to support his own decision. Such picking and choosing, emphasizing one senator's statement, ignoring another's, etc., will often appear to be an artificial and hypocritical game, but the game does not alter the fact that where different elements of a winning congressional coalition wanted different things out of a bill, or did not know what they wanted, judges and administrators are not only entitled but forced to choose one thing or another when it comes to specific enforcement.

The patent laws of 1952, however, offer a relatively rare, clear situation that neatly dramatizes many of these problems. We know what the drafters wanted—to undercut the Supreme Court. Here and there in the committee reports and other committee publications there are hints, quite obviously put there precisely so that they could later be used as "legislative history", that the bill did more than codify existing law. But it is absolutely clear, and indeed no one has questioned the fact, that, when the Congress voted, what it thought it was voting on and, therefore, what it said it wanted, was a simple codification. Only the most fantastically legalistic and artificial analysis, devoid of all commitment to political reality, could conclude that the legislative intent was what the drafters secretly wanted and, as we shall see shortly, expressed in deliberately ambiguous language, rather than what the Congress clearly thought it was doing.

What then did the new statute accomplish? The propatent forces had done what many interest groups do when they lose with one set of politicians: they tried another, Congress. But the propatent forces anticipated that if they tried to get Congress to explicitly reverse the Supreme Court's opinions of the late 1930s and 1940s, they might run into substantial opposition. Posing the real issue openly might have provided the stimulus, time and opportunity for antipatent forces to rally and counterpressure Congress. Instead the propatent forces exploited a tactical advantage to slip by an unaware Congress a statute too ambiguous to inspire opposition but one that might subsequently be used to help lever the Supreme Court out of its position. In adopting this tactic, however, the propatent forces paid a very high price to avoid opposition in Congress. They ended up with a statute that did not clearly show a congressional intent to reverse the Supreme Court and thus one that could not be a very effective instrument in forcing the Court out of its position.

For not only did the actual circumstances of the act's passage make it clear that Congress as a whole had simply intended to codify in 1952 whatever

the law had been in 1951, without even being aware of a difference between the Patent Office and the Supreme Court, let alone settling it on the side of the Office, but the wording of the statute itself was meaningless as far as the court-agency dispute was concerned. The key passage reads:

"A patent may not be obtained though the invention is not identically disclosed or described...if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."³⁴

This is simply a legislative restatement of the *Hotchkiss* test. The Supreme Court had consistently said that it was following the *Hotchkiss* test in reaching the results it did. The statute does not say that *Cuno* and *A.&P.* were misapplications of the test. If a statute repeats a judicially created test that has been used continuously, it is normally taken to incorporate into the statutory law the case law that has grown up under the test. Thus the statute of 1952 in this sense actually approves and confirms the Supreme Court opinions in *Cuno* and *A.&P.* In short if a statute says we affirm the test that the Supreme Court says it has been using, without specifically condemning the Supreme Court's results in applying the test, Congress is declaring its approval of whatever the Supreme Court has been doing.

On the other hand, it can be argued that the Supreme Court had really abandoned the good old test of *Hotchkiss* for a strongly antipatent position, so that when Congress writes the *Hotchkiss* test into the statute, it is really telling the Court to go back to the old propatent position. Aside from the fact that Congress wasn't telling the Court anything because it didn't even know what was going on, the difficulty with this argument is that it simply assumes what is to be proven, that the Court has really abandoned an old propatent policy embodied in *Hotchkiss* and that when anyone says the *Hotchkiss* words they really mean a low standard of invention.

Mr. BRENNAN. We have another former Commissioner, Mr. Chairman, former Commissioner Edward J. Brenner.

Senator HART. Before you start, I have a feeling we are going to be interrupted by a vote. You may begin.

Mr. BRENNAN. Mr. Brenner, you have a prepared statement. I assume you wish to have it printed in full at this point in the record?

Mr. BRENNER. Yes. I would propose that it be printed in the record and for me to highlight the different points in my prepared statement.

Mr. BRENNAN. Fine.

[The prepared statement of Mr. Brenner follows:]

STATEMENT OF EDWARD J. BRENNER

I appreciate very much being afforded the opportunity to testify before this Subcommittee on the subject of the general revision of the patent law, Title 35. My testimony today is based upon my overall experience in the fields of invention, innovation and patents including in particular the five years I served as United States Commissioner of Patents. However, my testimony also reflects my experience in corporate patent work in a very large company and a medium sized company and my experience in the private practice of patent law working with independent inventors and small companies as well as my experience of serving as Executive Director of the Association for the Advancement of Invention and Innovation.

As you know, the subject of general revision of the patent laws of the United States has been under active consideration now for nearly a decade. I hope that it will be possible to enact a meaningful revision of these laws during this Congress, which will strengthen the patent system, preserve the exclusive nature of the patent grant and increase the incentives for carrying out invention and innovation in our country. My comments today will be made in light of these objectives which are essential to achieving the

³⁴ 35 U.S.C. Sec. 103 (1964).

Constitutional objective of the patent system, namely to promote the progress of the useful arts for the public benefit. In accordance with the notice published in connection with these hearings my remarks will be confined to the five specific subjects listed in this notice.

PUBLIC ADVERSARY HEARINGS

As a member of the President's Commission on the Patent System during 1965-1966, I can report that the Commission gave long and careful consideration to the subject of public adversary hearings, such as the opposition or revocation proceedings which are provided in certain foreign countries. The Commission in its final report, however, recommended, in effect, against adopting such full scale adversary proceedings based on experience in other countries which resulted in harassment of applicants and patentees, long delays in the issuance of patents and costly and time-consuming proceedings for all parties concerned. Rather, the Commission recommended in Recommendation XI a procedure which they believed would produce the same substantive results for improving the validity of patents, but which would eliminate the abuses and problems experienced in the adversary proceedings in certain foreign countries. The recommended procedure involved placing the Patent Office in the position where it could review the prior art called to the attention of the Office by third parties so that they could decide whether there was sufficient merit in the third party's case that examination of the patent application should be re-opened.

Thus, I support the approach set forth in S. 643 (Committee Print) approved by this Subcommittee in the last Congress since I believe the procedure set forth in Sections 191 and 192 thereof would produce essentially the same advantage as would be obtained under Section 135 of S. 1321, and at the same time eliminate the disadvantages of adversary proceedings as experienced in certain foreign countries.

As I recall the situation, the Administration's patent revision bill in 1967 adopted the basic approach of the Commission on this subject, but with several administrative changes. For example, the procedure was changed so that the re-examination would be given to patents rather than applications as a result of a cost study carried out by the Patent Office. This study showed that millions of dollars involved in printing, filing, classifying and searching, in effect, two separate sets of patent documents could be saved by applying the procedure to patents rather than applications. Further, it was felt that there would be little, if any, substantive change in the effectiveness of the basic proceeding if it were applied only to patents.

S. 1321 provides that the Primary Examiner would handle the examination or re-examination of patent application under Section 135. I would strongly recommend that any legislation directed to this objective give the Commissioner of Patents the authority and flexibility of deciding upon the optimum procedure for such proceeding. Thus, there is one point of view that it might be better to have a qualified person other than the Primary Examiner who originally handled the case, review the new information to decide whether examination of the case should be re-opened since the original Primary Examiner might have a subconscious bias against reversing his original decision.

Hence, the Patent Office has considered the possibility of establishing a separate office for re-examination review. Another possibility considered was to have a three person panel review the new information which would include the original Primary Examiner and two other qualified people. In addition, the type of procedure employed might depend upon the number of requests for re-examination. Thus, the procedure established might be different if 1%, or alternatively 10%, of the cases were to become involved in the procedure. The optimum administrative procedure could, however, only be determined by actual experience. Therefore, it is believed it would be best to leave these matters to the Commissioner to determine on an administrative basis.

OFFICE OF PUBLIC COUNSEL

I am opposed to the proposal of establishing a position of Public Counsel in the Patent Office for a number of reasons, although I strongly support

the basic objective of this proposal, namely, to enhance the validity of issued patents. My reasons for opposing this proposal are that I believe that it would create substantial administrative problems, that it would not accomplish its intended purpose and that there are alternative ways to spend the resources that would be involved which would better accomplish the objectives of this proposal.

In my judgment, the present Examiners in the Patent Office are in a much better position, based on education and experience, to handle the examination of patent applications than would be any member of the staff of a Public Counsel. In addition, the present Primary Examiners are each a specialist in their particular field of technology and are much better trained to find and evaluate pertinent prior art than any generalist from any Public Counsel office. The present Examining Corps is dedicated to the twin principles that they are responsible for issuing patents on patentable inventions and refusing patents on unpatentable inventions which are the fundamental objectives of the patent laws of the United States. I firmly believe that it would be a grave mistake to delegate this important responsibility to less qualified individuals.

In my view, the key to improving the quality of examination in the United States Patent Office and narrowing the gap with respect to the review in the Federal Courts in litigation is to bring before the Examiner more pertinent information than is now available to him. At the present time, steps are underway to improve the Examiners' search files with respect to foreign patents and non-patent publications. In addition, the proposed re-examination procedure of patents should make available to the Patent Office prior art in unpublished form, such as public use or sale of an invention. Such prior art, if considered pertinent to the question of validity, would in fact be considered in an adversary proceeding. Thus, these new procedures should considerably enhance the validity of issued patents. In addition, it is recommended that the Patent Office should expand its efforts directed toward obtaining a better understanding of the quality of patent examination in order to aid it to evaluate steps that might be taken to further improve the effectiveness of their examination.

DEFERRED EXAMINATION OF PATENT APPLICATIONS

The Presidential Commission on the Patent System also considered in great detail the question of deferred examination of patent applications. The Commission concluded that it clearly favored a high quality examination system if it could be maintained without a constantly increasing backlog.

The subject of deferred examination systems arose in the early 1960's when the examination system in the Netherlands, Germany and the United States were struggling with increasing backlogs of unexamined patent applications and resultant delays in issuing patents. During this period, and under my direction, the United States Patent Office conducted studies directed toward evaluating the costs and benefits of various types of deferred examination systems in the United States. The general conclusions that were developed from these studies were the following: (1) The advantages and disadvantages of deferred examination were about a standoff in terms of the Patent Office budget; thus, although there would be savings in examination effort, these savings would be about off-set by increased printing costs and effort required to process, file, classify and search the increased number of patent documents, and (2) deferred examination would therefore only be justified if it were not otherwise possible to prevent increasing backlogs and delays in issuing patents. As a result of the streamlined examining program adopted in the 1960's and other related programs, the backlog of pending patent applications in the U.S. Patent Office has been substantially reduced. As a result, the period of pendency of patent applications has been substantially reduced toward the Patent Office goal of 18 months.

With regard to the cost impact of a deferred examination system on the private sector of the economy, I doubt that there would be any significant savings, if any, based upon my personal experience. Thus, the greatest share of the cost of obtaining a patent is involved in preparing and filing a patent

application. While it is true that the cost of prosecuting a certain percentage of filed applications could be saved, I believe that this would be perhaps more than off-set by (1) the greater cost of patent searching due to an increased volume of prior art to search (2) the greater volume of patent documents which would have to be processed and (3) the greater number of patent studies required to evaluate scope and validity of the large number of unexamined patent documents which would present current or future infringement questions.

Thus, in my opinion, a deferred examination system is distinctly a step backward with regard to trying to maintain a high degree of certainty with regard to validity and scope of patent protection. Thus, we should not overlook the great contribution the U.S. Patent Office makes to the effectiveness of operation of the system. More particularly, about 30% of the patent applications filed are not issued as patents because the inventions are not patentable. With regard to the remaining 70% of the applications, in most of them the original broad claims are limited during the examination to a more reasonable scope with respect to the patentable contribution involved.

Based on first hand experience with their deferred examination systems, it is understood that the European countries are recommending basically a full search and examination system for the proposed new European patent system. Therefore, in view of the European experience coupled with the fact that the U.S. patent examination system is rapidly approaching a pendency of 18 months, it is suggested that it would not be in the interest of the country to adopt a deferred examination system.

During my term as Commissioner, the Patent Office instituted a new program known as the Defensive Publication Program under which an applicant could elect to have the examination of his patent application, in effect, deferred for 2½ years. It was anticipated that perhaps several thousand applicants per year would elect to enter the program and thus the Patent Office would save a corresponding examining effort. In practice, however, only a few hundred applicants elected to enter the program each year. Nevertheless, the program to the extent it has been utilized has been apparently highly successful from the standpoint of patent applicants and the Patent Office since, so far as is known, none of the applicants have requested examination of their applications. Therefore, perhaps the program should be strengthened such as, for example, by affording a patent application laid open to public inspection under the Defensive Publication Program the same status under Section 102(e) as in the case of a granted patent.

PATENT FEES—MAINTENANCE FEES

During my term as Commissioner, the Patent Office also initiated a detailed study of Patent Office operations in relation to Patent Office budgets and fees. Basically, this study concluded that: (1) certain Patent Office operations are conducted primarily for the benefit of the party requesting a particular service such as the procedural handling involved in the filing of patent applications and issuance of patents; (2) certain Patent Office operations are conducted for the benefit of patent applicants and the public jointly such as the examination of patent applications; (3) certain Patent Office operations are conducted primarily for the benefit of the public, such as the printing of patents and the maintenance of a Patent Search Center for the public; and (4) the Patent Office should be authorized to have a revolving fund for financing on a full cost recovery basis a variety of special user services. Overall the study indicated at the time of the study that such an approach to relating Patent Office fees to costs would recover about one-half of total costs. In my judgment, an approach to setting Patent Office fees along these lines is a better way to handle the matter as compared with "picking a number out of the hat" such as simply saying Patent Office fees should recover say 65 to 75% of costs.

On the basis of the aforementioned Patent Office study, perhaps only a relatively modest increase in Patent Office fees would be required. In this case, I would not propose instituting a system of maintenance fees. How-

ever, if it is decided that Patent Office fees should be increased in the range of 50 to 100%, then I think that a system of deferring a portion of the total fees for payment at some time after the filing and issue fees should be given serious consideration. In my opinion, the present Patent Office filing and issue fees should definitely not be increased and in fact probably reduced. I base this conclusion on the information contained in the graph attached to this statement showing the change in percentage of patents issued to individuals during the period 1950-1970, which graph was published in the February 1973 issue of *Action*, the journal of the Association for the Advancement of Invention and Innovation. My interpretation of the figures in this graph leads me to the conclusion that the fee increase in the middle 1960's resulted in a reduction of several thousand applications in the filing rate by individual inventors. I would also predict that a further substantial reduction in patent filing by individuals would occur again if fees are raised substantially.

Thus, if Patent Office fees must be increased substantially, I would recommend that the filing and issue fees for simple cases be maintained in the range of about \$100 as proposed in subparagraph (b)(1) of Section 41 of S. 1321 and that the remainder of the necessary fee be deferred under a system whereby additional fees would be paid every 3rd, 4th or preferably 5th year on those patents which are used commercially.

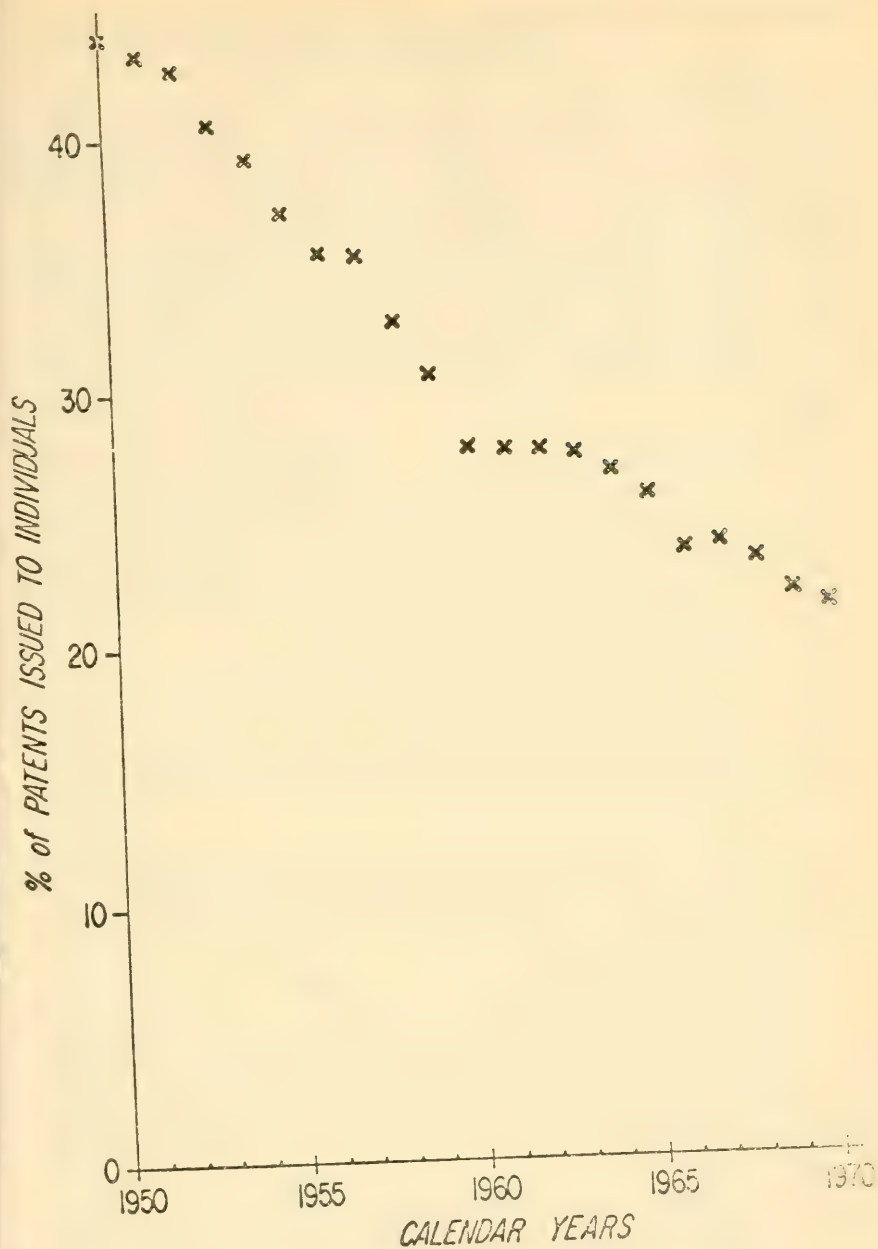
I believe it is clearly preferable from an administrative standpoint for both the Patent Office and patentees to avoid any system of annual fees. Also, while I am entirely sympathetic with the financial problems of individual inventors and small businessmen, I do not think it is administratively feasible to distinguish this type of patentee under subparagraph (b)(2) of Section 41 of S. 1321 from other types of patentees. Thus, I favor a system in which a portion of the Patent Office fees are deferred and are paid by successful patentees, if fees must be increased substantially, as compared with increasing substantially the present filing and issue fees or adopting a system of annual maintenance fees as used in a number of foreign countries.

ADMINISTRATIVE RESTRUCTURING OF THE PATENT OFFICE

Based upon past experience with the present administrative structure of the Patent Office, I believe the time has come to seriously consider an administrative restructuring of the Patent Office. I have proposed for several years the establishment of a new position of Assistant Secretary of Commerce for Invention and Intellectual Property to centralize and elevate the voice for invention, innovation and the patent system in the Executive Branch of the Government. While I believe that there are many advantages for such an organizational change, I originally received little support for this proposal. It now appears that there is considerable support for elevating the voice of the patent system to the Assistant Secretary level. Also, I realize that there is a certain amount of support for making the Patent Office an independent agency, such as proposed in S. 1321.

All things considered, I favor on balance continuing to maintain the Patent Office in the Department of Commerce, but on a completely different basis from the present organizational arrangement. More particularly, I would strongly support as a minimum change elevating the position of Commissioner of Patents to the Assistant Secretary level and preferably to the Under Secretary level so that the Commissioner would no longer be required to report to the Assistant Secretary of Commerce for Science and Technology. This administrative change would be similar to the change that was made several years ago in the status of the Weather Bureau which also formerly reported to the Assistant Secretary of Commerce for Science and Technology. I firmly believe a similar change in the organizational structure would have a significant effect on the climate for invention and innovation in our country and in strengthening the contribution of the United States Patent Office in the operation of our nation's patent system.

This concludes my prepared statement and I would be pleased to try to answer any questions there might be on my comments as to supplying any additional information for the record.



STATEMENT OF MR. EDWARD J. BRENNER, FORMER U.S. COMMISSIONER OF PATENTS

Mr. BRENNER. Initially, Mr. Chairman, may I say I am testifying purely in an individual capacity this morning, but my testimony is based on my 5 years' service as Commissioner of Patents, as well as my work in patent work in a very large company, a medium-sized company, as well as now being in private practice.

My present work involves the patent activities of independent inventors and small companies, as well as my experience in serving as executive director of the Association for the Advancement of Invention and Innovation, which is an organization of people of many different backgrounds interested in trying to solve the problems, some of the problems that are being discussed here today, and to try to improve the climate for invention and innovation in the United States.

Referring to the matter of public adversary hearings, I would mention that I served as a representative of the Secretary of Commerce on the President's Commission during 1965 and 1966. This was one of the major subjects to which the Commission addressed itself. The Commission came out with a final conclusion that there was a need for a proceeding by which the public could bring to the attention of the Patent Office pertinent prior art which was either missed by the Patent Office or not available to the examiners.

But one of the major conclusions was that the Patent Office should serve as a screening body to identify which prior art might be meritorious and which had little if any value to it. This was based on the experience with the European systems which were evaluated and studied quite carefully, where certain abuses were recognized which have been referred to before, that sometimes patents were not issued until after the patent really expired.

So the proceedings, in many cases, were very time-consuming and very expensive. So what the Commission felt it could propose, would be if the Patent Office were to screen this art, you could get the same substantive results as in a full scale adversary proceeding, and you could eliminate the abuses.

I subscribe to that. I think that that would be in the best interests of the public of the United States.

Just a couple of points of administrative detail in connection with the subject of adversary proceedings. As I recall, the Presidential Commission did recommend that after applications were allowed, they were to be published and subject to having the public call to the attention of the Patent Office prior art that could be considered in the reexamination procedure.

However, when we evaluated this in the Patent Office, we felt that if we had to publish two sets of documents, in other words, publish everything once as an allowed application, and publish everything again as a patent, that the printing costs and the costs to the Patent Office and to the public of processing really two sets of patent documents outweighed any possible advantage.

The administration bill that was introduced to the Congress recommended that the patent be granted and then have a proceeding for

reexamination so as to get all the advantages but yet save substantial amounts of manpower and printing costs.

Second administrative point—when the bill was introduced we proposed—and I think this was in S. 643—that the Commissioner would have the administrative flexibility to establish precisely the details of reexamination. So through experience it would be possible to arrive at the optimum arrangement. Therefore, it would seem to me that it would be best not to require the Commissioner to use the primary examiner that may have handled the original case, because there has been strong feeling in certain quarters that it might be better to have a different examiner or different set of examiners to take a fresh look at it, because the original primary examiner might subconsciously have some feeling that because he allowed the case the first time, that maybe it might not be the thing to do.

I do not think there would be anything intentional here, but nevertheless, the idea was to provide the possibility of a fresh look by a fresh group of examiners.

Moving on to the matter of the Office of Public Counsel, my experience would tend for me to conclude that I would be opposed to the establishment of the Office of Public Counsel. In any event, if this were to be considered in any future legislation, I would strongly recommend that a more detailed establishment of what would be involved in this should be presented, because I hear all kinds of different versions. I don't know whether anybody really knows precisely what we are talking about. But my experience would indicate that there could be many administrative problems. I am not sure that the end result would accomplish the intended purpose.

And furthermore, I think for X millions of dollars that would be involved here, I feel that there are other ways that this money could be spent to improve the validity of issuing patents. I'm wholly sympathetic with the objectives, but I think there are better ways to proceed.

For example, the question of whether a patent should be granted or not, I think, could be much better handled by the present primary examiners in the Patent Office who have the education, the experience. They are specialists in their particular field. I think it gets down to the real judgment that has to be made in the Patent Office: that is, is this invention new, useful and particularly unobvious to a man skilled in the art? The primary examiners by their training are inherently better able to make this very important judgment.

I would point out that in my judgment the key to improving the quality of the output of the U.S. Patent Office is to provide means, new means for bringing more information to the attention of the examiners, and there are steps under way here, for example, to improve the examiners' search files for foreign patents and unpatented publications to provide, among other things, English language extracts of these important pieces of prior art.

Also, it seems likely that some sort of reexamination procedure will result from the present hearings, and will be enacted into law, and this will provide greater information to the Patent Office with which to enhance the validity of the issuing of patents.

Also, I would strongly recommend that concentrated effort be made to study and evaluate just what do we mean by quality. When I was Commissioner we started a very extensive program to really get to the nuts and bolts of what are we really talking about. For example, it seemed to me very clear that there is a matter of human judgment involved here where reasonable men can differ. I do not think that you should ascribe any negative aspects to the Patent Office in situations like this.

For example, if the Supreme Court comes down to a ruling of 5 to 4 in favor of a particular view, does that mean that the other four judges do not have a reasonable basis for their position? This is really what goes on in the Patent Office. There are some applications on inventions that are clearly unpatentable, and they are rejected, and there are applications on inventions, I think everybody would agree, are clearly patentable and the patents are granted on these. But out of about 100,000 applications filed each year, in the middle there are some very, very close questions where I think people of reasonable judgment can disagree. I think factors like this need to be evaluated to really come to grips with what kind of quality problem do we have, what is its nature, what steps do you take to improve.

Moving on to deferred examination, this was another one of the major subjects that was carefully considered by the Presidential Commission which came to the general conclusion that they were in favor of a high quality examination system, basically, and that this could be accomplished. They were in favor of it, and only if this were not possible would they recommend any possibility of deferred examination.

When I was Commissioner of Patents in the middle of the 1960's, of course, this subject was a very hot item because the Dutch and the Germans were considering adopting it. We took a careful look at it in the United States, and we came to the conclusion that as far as the U.S. Patent Office was concerned from a budget standpoint, we could save a little bit on examining manpower but in other areas we would have to use more manpower, we would have more printing, and the net effect would be it was not really going to help the U.S. Patent Office from a budget standpoint, and that deferred examination was only really justified in case the Patent Office could not keep up with its workload.

I might say from my personal experience in the private sector, I feel that although there would be savings in certain aspects of patent work under a deferred examination system, I think that this would be completely offset by other costs, and it would really not be a good step for the United States to take.

I would like to make this point very strongly. I think that people should recognize the great contribution that the U.S. Patent Office makes to the matter of certainty of the operation of the U.S. patent system. It is not perfect, but if one were to live without an examination system, I think they would recognize a great deal of the problems that are involved. In fact, the French had a nonexamination system and they concluded that this was not working in the best interests of their country, and they subsequently revised their patent system.

But what the Patent Office does, it eliminates, say, about 30 percent of the patent applications because the inventions are not patentable. In most cases, in the remaining 70 percent, the claims are trimmed down to a more reasonable scope. In my judgment, these are great contributions to the certainty of the patent system, and without this, such as in the case of deferred examination system, we would find and experience a number of undesirable results.

I would point out that the European countries that are now developing European patents, are planning on having basically a full examination system, and I know from personal discussions with people such as Dr. Haertel, head of the German Patent Office and the EEC study group, that they feel that the best system is the full examination system.

Moving on to the matter of patent fees and maintenance fees, I would point out that I came in as Commissioner of Patents at the time, just about the time the last fee bill came into effect, and I remember the discussion. There were some groups that said that the patent applicant should not pay any fees. Other groups said that the applicant should pay fees to recover 100 percent of the cost of running the Patent Office, and finally legislation was passed say 65 to 75 percent. But I think everyone recognized that this was sort of a compromise between the different views, sort of picking up a number out of the hat.

So I thought that probably in another 5 years or so, the subject would come up again, and I thought that we ought to try to approach it more logically. So a study was started while I was Commissioner to try to analyze the different operations that we conducted to try to find out who should really pay for these, and it came out that there were certain operations which really a patent applicant should pay for. There were others that were sort of mixed, that the patent applicant and the public should share these. Then there were certain operations clearly for the benefit of the public, and that these should not be paid for by the applicant.

The overall result of the study indicated that about that time fees should recover about one-half of the total costs of operating the Patent Office. Somehow I think that probably the results of that study would still apply to today's situation and the Patent Office fees should probably recover about half of the total cost.

I guess that recovery is now down to about 40 percent, so that on the basis of this study, I would say that it was maybe time to consider a somewhat modest increase in Patent Office fees.

However, if we talk in terms of substantial increases such as have been mentioned in the proposed legislation, the fees could increase 50 to 100 percent, and if this became necessary, I think that the fees, the filing fees, the issue fees, would be getting rather burdensome, particularly on small companies and independent printers.

I have attached to my statement a graph which was printed in the February Issue of *Action*, the journal of our association, and to me, the interpretation of these figures indicates that the percentage of patents issued to independent inventors was leveling off in the early 1960s for mainly about 4 years ago, and that when the fee bill came in, suddenly there was quite a significant dropoff.

So, my interpretation would lead me to conclude that several thousand applications by independent inventors were not filed because of this fee increase, and I think any big increase in the future would have the same result, and I think that is undesirable. But if we have to have a significant fee increase, I think the concept of S. 1321, of keeping the initial fees down in the range of \$100 is not a bad idea. I think it's aimed at trying not to discourage people from coming into the patent system, and I would be in favor of deferring part of the fees, to be paid, not on an annual basis, but perhaps every third, fourth, or preferably every fifth year. I am not in favor of the tremendous fees provided in S. 1321, but I think if, say, the fees are to be increased in the range of 50 to 75 percent of the cost of operating the Patent Office, I think that we could have a situation where you would keep your fees—initial fee relatively low—and yet not have very high maintenance fees.

Moving on to the last of the five subjects, the administrative restructuring of the Patent Office, I might point out that for many years I have been proposing the establishment of a new position of Assistant Secretary of Commerce for Invention and Intellectual Property.

Initially I did not have much support for this, but I think that from many different quarters there is increasing support for elevating the voice of the patent system in the executive branch of Government to say to the Assistant Secretary level.

All things considered, I believe that at this particular point in time, it would be desirable to elevate the position of the Commissioner of Patents in the Department of Commerce such that it would no longer be required to report to the Assistant Secretary of Commerce for Science and Technology, so that the position of the Commissioner of Patents should be elevated to the Assistant Secretary level or preferably the under-secretary level. There are certainly precedents for this in the Department of Commerce because when I was Commissioner of Patents one of the sister bureaus was the Weather Bureau, which has subsequently been raised. I understand, to the level of Under Secretary of Commerce, who reports directly to the Secretary of Commerce. I believe that such a change in the case of the Patent Office would be highly desirable, and would improve the operation of the office, and improve its contribution to the operation of the U.S. patent system.

So, Mr. Chairman, that concludes an overview of the highlight of my prepared statement.

Senator HART. Thank you, commissioner, for the summary, and for the statement.

On this business of fees, you made your position clear both in your summary and in your prepared statement. In your prepared statement on page 11, you put it this way: "In my opinion the present Patent Office filing issue fee should definitely not be increased; in fact, it should probably be reduced." And you referred us to the graph attached to your statement which reinforces your concern about the declining number of patents issued to individuals.

I think all of us share that concern. Now, that is the reason for proposing keeping the initial fees to a minimum and getting back

the Patent Office costs through maintenance fees for the life of the patent, and presumably after the invention has been marketed.

Now, the schedule of the maintenance fee provided for in S. 1321, often has been criticized as being too high, and burdensome both to the Patent Office and to the patent holders because it is on an annual basis.

You have reacted to that, suggesting perhaps 3, 4 or even 5 years as the period between fee payments.

Could you elaborate just a little? Let me ask it this way.

Why would it be more burdensome on an annual basis than on a 5-year basis? Is there any significant burden that is avoided by spreading it out?

Mr. BRENNER. I think there is—part of this is administrative or clerical, involving having to send out notices and send in fees. Second, there is a professional judgment that has to be made, and if you have to get a committee of people who are experts in different aspects of the company's business, if you have it every year it consumes more professional time than if you had to do this every 5 years.

So I think those are the factors which for anybody who has had experience with the foreign systems of doing this every year, it gets to be quite a task. So the idea here was, I think, that enough money could be raised on a 5-, 12-, 15-year basis or something like that to provide the income, and yet, avoid some of these administrative problems.

The first fee I think is quite important. I think you recognize that in the bill, S. 1321, by giving a patentee enough breathing room timewise to see if he could not generate some interest, and I think that is particularly the most important part of this.

And also I think the system, particularly for independent inventors, should not be too burdensome; because if a person has to pay a fee, he may drop his application. I know of inventors who have done this. This is in foreign countries. They have dropped their patents only to find out that, by golly, somebody had generated some interest, and they could have licensed their patents for a royalty if only they had the patent. Because they did not have the patent, the prospective licensee did not feel justified in commercializing it, and nobody gained from it.

So if we have to have a system of deferred fees, I think it should provide the least disincentive in trying to make the patent system work the way it is supposed to; that is, for the public.

Senator HART. You mentioned the foreign experience. What, to the extent that you understand it, has been the experience abroad with maintenance fees?

How do they keep track of them?

Do you have any ideas about that or any knowledge?

Mr. BRENNER. As I understand it, it is up to the individual or the patent agents to keep track of when these fees are due and to send notices around and to then make these judgments as to when these fees should be paid. These are done either annually—some organizations have computerized systems of doing this. It does involve a lot of shuffling of a lot of paper.

Senator HART. Do you know whether there has been developed firms? Who would engage them? The patent holder or the Patent Office?

This computer business that you mentioned, who has got it?

Mr. BRENNER. As far as I know, the foreign patent offices do not send out notices, and the responsibility rests with, say, your patent agent in Germany or England to keep track of when these fees are due and to send through a notice saying that it is now time to pay, say, the third annuity in Germany.

I happen to work as a consultant for an organization in the United States that has a computerized system, and companies that use that system, and there are other systems, have in a data bank all the information on the foreign patent holdings of different particular clients, and the computer then generates on a quarterly basis which foreign assets have taxes due on a quarterly basis. Then you say pay these, do not pay those. Then these companies will execute your orders by seeing that the fees are paid; and if they are not paid, the patent will then be dropped in a particular case.

Senator HART. How expensive is that?

Mr. BRENNER. I think depending upon which type of system you operate, you probably have to pay a fee between \$10 and \$25 per payment over and above the payment per se. Actually in some of these countries the cost of paying the fee is more than the particular fee at a particular time.

Senator HART. The last question, how would you suggest the amount of the maintenance fee be set?

Mr. BRENNER. I think it would be interesting to maybe look at those previous studies in the Patent Office. I forget what we had. I think we may have had something like \$100 at 5 years and \$200 at 10 years and \$300 at 15 years.

I think the studies indicated that this would provide enough income to keep the level of recovery at this 50 percent level for quite a while in the future. The higher the fee, of course, the more people you discourage, and you get less income. We based our estimates on some European experience, and I think we were satisfied that you could operate, say, on a 5, 10, 15 year level, with something on the order of a fee of \$100 or \$300.

Senator HART. Mr. Brennan.

Mr. BRENNAN. Mr. Brenner, why should the taxpayers bear half the cost of the examination process in the Patent Office?

Mr. BRENNER. You can compare a full examination system, with say a registration system such as France had for many years, where nobody has to pay anything. In this case the patent system works in that you encourage people to come into the patent system, have their applications published, and disclose new technology.

That is the basic purpose, to give people, to encourage people, to provide them with an incentive to come forward and have this technology published. You will do that and fulfill the basic principle of the patent system by encouraging people to come in and having their application published for the benefit of the public.

You do not have to have an examination, but I think it is helpful to the public to know if the invention is patentable; and if so, what

is the scope of it. I think it is also perhaps equally beneficial to an applicant to know that when the chips are down he does have a patentable invention of such and such a scope.

So in my judgment it is clearly to the benefit of both to have a system of examination. It is of benefit to both of these parties. What the exact share is I do not know, but our studies said, well, it is of equal benefit, 50-50.

Mr. BRENNAN. You can make the same argument about many other government functions, for example the public benefit from radio and television stations. Should they pay part of the filing fees of the broadcaster at the FCC?

Mr. BRENNER. Mr. Brennan, I am not an expert in that field. Perhaps that might be the case.

Mr. BRENNAN. I am not trying to belabor this particular issue. Since I work for the chairman of the Appropriations Committee, I have to bear in mind the burdens which the committee has in trying to live within the existing budget.

Turning to another issue, the previous witness emphasized that much of the reduction in the backlog in the Office was accomplished by stressing quantity at the expense of quality; and hordes of invalid patents have been pouring out of Crystal City in the last several years.

Would you comment on that in two parts? First, during the term of your service as Commissioner, and then your observation of the scene since you left the Patent Office.

Mr. BRENNER. First of all I would say I do not think the system will ever be perfect, and I think there is no doubt that there are invalid patents that are issued for one reason or another—some because certain prior art was not available before the examiner, some because one person might think it is patentable while another person may not.

I think that when you work with this matter of quality you must consider many different factors. If you want to run full-scale validity proceedings at the Patent Office such as in the case of litigation, instead of spending a hundred or a thousand dollars for the proceeding—and somebody has got to pay for it—you are up to the tens of thousands or the hundred thousands of dollars.

I do not think that it is an economic procedure to try to have the Patent Office operate as a court. I do not think you can afford to give that kind of treatment to 100 percent of the applications.

But when I was there as Commissioner of Patents we did change our procedures, which increased the output of the Patent Office, and we kept very careful figures on those. And we changed the system in a way in which—actually we increased the percent of the amount of time that was spent on searching the prior art.

I knew that some people who had not made an analysis started going around and saying that the quality was lower, but I will be happy to sit down and go over those figures we have in the Patent Office with anybody and show that we actually did improve in my judgment, improve the quality of the product and increase the search time.

As far as I know, this has continued. I have no reason to believe that there has been any change in this quality in the past 10 years.

Mr. BRENNAN. One final question. Did you become Commissioner of Patents because of your political influence and active role in politics?

Mr. BRENNER. I am glad you asked me that question. Unfortunately, I would say the Commissioner of Patents has always changed as the administration has changed. I personally think that that is not in the best interest of the operation of the system, but being Presidential appointees, perhaps that is inherent.

I would say this, that I was a registered Republican, and I was appointed by a Democratic President, Lyndon Johnson. And like Commissioner Schuyler said, if that is a political operation or political plum, it escapes me.

Mr. BRENNAN. Thank you.

Senator HART. I was tempted to undertake a definition of political plum when the question was raised earlier, and I think there is not any universally agreed upon definition. Some would define it as a job that changes with administrations.

Mr. Nash.

Mr. NASH. Let me ask one question, Commissioner. This relates to the quantity and quality of patents that are issued. It has been expressed to me by a number of examiners, and indeed in the literature—and we will have some examiners in, and we will explore it—it has been expressed to me that over the past 5 years or so a quota system has been reimposed on the Patent Office. Examiners are required upon pain of lack of promotion or other problems created for them, to issue a certain number of actions within each period.

And it would just seem to a nonpatent expert that any kind of a requirement for a quantity production would of necessity have to reduce the quality; and I would like your observation on the logic of that statement, as well as any information that you have on the facts of whether a quota system does exist.

Mr. BRENNER. I think the patent system has to operate, at least with respect to the operation of the Patent Office, based upon two major points. One is the patent laws, the type that we are talking about here today, as to how the patent system is to operate; and secondly, you have to operate within the budget provided by the Congress.

As I say, Congress says this is the kind of operation we want to run here, the amount of money we are giving you to operate it. The Patent Office and any Commissioner or anybody else in the Patent Office has to operate within that framework.

So maybe you could look at it one way, that OK, if this is a job we have to do, somebody imposed some limits on the amount of resources that we can apply to this. If you want to call that a quota system, okay. That is the way you look at it. I do not really look at it that way.

This is one of the reasons why I said that I thought that there should be greater study in depth of what is involved in this quality. I think probably if you double the budget of the Patent Office from \$70 million to \$140 million, increase the staff from 2,500 to 5,000, you would probably have a better quality product coming out. But the question is is that extra \$70 million worth whatever you gain? Herein I think is where the problem is—how much is quality worth?

So anyway, that is the way I would answer that question. And I doubt if the Patent Office ever will get in the position where it has enough time and manpower to do the perfect job. I just do not think that would help, and it is a matter of balance.

Mr. NASH. As I understand you, you are saying that yes, a minimum output requirement exists.

Mr. BRENNER. I think the Congress tells me, when I was Commissioner, that it gives me a budget. I give you so much money to do this job, to process so many applications. If that is called a quota or whatever it is, I think that is the way the system has to operate. It is not only true in the Patent Office; it is true any place. You can look at any agency. They have got to operate within their budget. And if you wish to call the work outputs quotas, so be it.

Mr. NASH. Thank you.

Senator HART. Thank you again.

Mr. BRENNER. Thank you.

Senator HART. Because of our policy committee luncheon at 12:30, I would suggest that we recess now until 2.

[Whereupon, the hearing in the above-entitled matter recessed for lunch at 12:25 p.m., to be reconvened the same day at 2 p.m.]

AFTERNOON SESSION

Mr. BRENNAN. The first witness for the afternoon session is Charles M. Hogan.

Mr. Hogan, we have a prepared statement which I trust you wish to have printed in full at this point in the record.

Mr. HOGAN. If you please, Mr. Brennan.

And with the Senators' permission, I would like to streamline it with a few remarks.

[The prepared statement of Charles M. Hogan follows:]

STATEMENT OF CHARLES M. HOGAN, ATTORNEY AT LAW

CINCINNATI, OHIO,

September 11, 1973.

Re S. 1321, The Senator Hart bill.

Honorable Chairman and members of the committee, my name is Charles M. Hogan. I present this statement and appear to testify in favor of certain features of the Hart Bill. The views herein expressed are offered solely on my own responsibility and are not represented to be those of any other entity.

I have been employed in patent work on behalf of Avco Corporation for twenty-six years, during the last seven as General Patent Counsel. Prior to employment by Avco, and beginning in 1940, I successively worked in the general practice of law at Wellston, Ohio, as a junior examiner in the United States Patent Office, and as a patent lawyer with the Hazeltine Electronics Corporation in New York City. During my service years I was assigned to the Bureau of Naval Ordnance. Between the end of World War II and association with Avco I engaged in the private practice of patent law in Chicago.

I served one term as President of the Cincinnati Patent Law Association, participated actively in bar association committee work and published several law review articles on subjects related to patents.

While I speak from a corporation-oriented point of view, it has been my privilege to work closely with inventors, some humble, some renowned, such as Ronald J. Rockwell, chief engineer for the "Voice of America," the late Herriek L. Johnston, head of the Cryogenics Laboratory at Ohio State University, and Professor Richard H. Engelmann, head of the College of Electrical Engineering, University of Cincinnati. I have individually prosecuted several

hundreds of patents and have been attorney of record in the issue files of several hundred more.

I share the concern of this country and this honorable Committee that the United States is confronted with an energy crisis, an ecology crisis, and inflation, all at a time when Japan, the Soviet Union, and others are giving us very hot competition for technical leadership. The patent system has always been one of the spark plugs of our economy and growth in technology. However, it suffers from a certain lack of confidence both in the courts and in the public eye just at the time incentives are most needed.

THE PROBLEM AND THE BROAD PRINCIPLES REQUIRED FOR SOLUTION

Various factors—including caution on the part of patent attorneys, difficulty in predicting the future course of inventions, catering to the vanity of clients and senior engineers, the reluctance of patent attorneys and agents to pass judgment and reject patent application opportunities, and the statistical fact that a fraction of the inventions zealously protected achieve success—cause the work load of the United States Patent Office to consist, not only of thousands of applications pertaining to true inventions, but also a large number—in my opinion a greater one—representing no more than the ordinary skill of the art. The efforts of the patent attorneys, in prosecuting the aggregate work load, tend to depress the Patent Office standard of invention below the level of the constitutional intent. Examination is superficial. While the veteran examiners and the directors of the examining groups and the members of the appellate tribunals of the Patent Office are generally men of substantial experience and scientific knowledge, they are frequently academic types not close to industry. The front line examiner is often a junior, a recent engineering or science graduate, armed with a superficial grasp of the art. The inevitable result is that the examination is often incomplete. Even when conducted by a senior examiner, it does not extend adequately into the literature or the foreign prior art. The presentation by the applicant is unilateral, and the Patent Office has no machinery to determine effectively whether statutory bars exist.

Thousands of applications are filed which should not have been filed. Thousands of patents issue which should not have issued. The efforts of the Patent Office are so diluted in the examination of meritorious inventions that when the patent on these properly issue the absence of a complete citation of prior art often constitutes an undesirable cloud on them.

While the courts pay lip service to the presumption of the validity of patents, they declare invalid or not infringed the majority of fully litigated patents.

The usual invalid patent represents an attempt to monopolize something in the public domain. Instead of advancing the progress of science and the useful arts, it handicaps them in that it is a powerful weapon in the hands of the occasional not-too-scrupulous management. Even an invalid patent can be used as a basis for extensive, complicated and costly discovery proceedings and trials so that defendants, unable to finance \$100,000-and-up defenses, are compelled to surrender rather than risk the cost, loss of time and worry of litigation, which boils down to ordeals by expert when the technical issues become abstruse. The issuance of an invalid patent is accordingly a disservice to the public. Consider now the mine field of invalid patents into which a manufacturing industry must carefully tread when it is planning a new product or an improvement to an existing product. I do not say that most patents are invalid. I do say that the many invalid patents constitute a marsh and a briar patch and an affirmative obstacle to the progress of science and the useful arts.

The objective here is to establish reforms that will greatly strengthen patents on meritorious inventions and will weed out attempts to monopolize what should not be monopolized and patent applications that do not represent an affirmative contribution to science and technology. While there is much to be said for getting all inventive concepts and disclosures out on the table, nonetheless the patent law profession must sift judiciously and the examination in the Patent Office must be elevated to a new order of rigorousness and depth.

This cannot be accomplished by multiplying the number of examiners in the Patent Office. There is no reason to assume that even an extensive completely financed recruiting program in the Patent Office is going radically to increase

the general order of competence of the examiners. A way must be found in which to enlist the affirmative and enthusiastic aid of industry and inventors and patent attorneys in furnishing input data for the examining process.

The experienced attorney generally overpowers the relatively inexperienced examiner in the over-all lowering of the standard of invention in the U.S. Patent Office. This is a major reason for the issuance of invalid patents. A very secondary reason is misrepresentation and fraud on the part of patent attorneys and applicants. Patent attorneys as a class are as ethical and dedicated a group of professional men as can be found. They are generally candid in their dealings with each other and with the U.S. Patent Office, but there are a marginal few who are standard forms for reissue oaths, who withhold knowledge of the most relevant prior art from the U.S. Patent Office, who present false oaths for signature by applicants, and resort to like sharp practices. In recent years, the courts have become more and more inclined to look into these and to hold patents unenforceable for fraud and unclean hands. There is need for machinery in the U.S. Patent Office that would discourage these practices and subject them to rigorous scrutiny. There is need for an agency whose very presence would constitute a detriment to fraud.

We must find a way to bring to bear on the examination process all available input intelligence and maximum competence and attention. At the same time, this optimum examination must be accomplished without unduly burdening the applicant, particularly the independent inventor. Many of the best inventions come from the individual inventors, the men who either do not know the rules of science or know them too well, the cross pollinizers, the men who take an unorthodox view of the status quo in technology, the men who are not satisfied with things as they are, the men who do not have to conform to corporate policy. The machinery must not be so elaborate as unduly to burden them or the already heavily overburdened taxpayer.

Let us now compare these objectives and the various curative proposals that Senator Hart is making.

THE PUBLIC COUNSEL—SECTIONS 3, 24, 132, 134, 142, AND 148

The Public Counsel principle is eminently sound but there is some confusion in the proposed legislation as to the proper functions of the proposed Public Counsel and the present office of Solicitor in the United States Patent Office. The present office of the Solicitor should be continued. The Solicitor is the legal adviser to the Commissioner of Patents. He handles petitions on special matters and represents the Commissioner in defending appeals by applicants to the Board of Appeals. Most of these appeals involve the question as to whether or not an invention is patentable over the prior art. The Solicitor and the Boards of Appeals are thoroughly competent to perform these functions and their role should be continued. However, there are a number of bars to patentability which the Patent Office does not have adequate machinery to inquire into and the best prior art may not be on the record. The proper role of the Public Counsel is to inquire into these matters and to accomplish compliance with the very rigid requirements of candor and good faith that Sections 115 and 131 of the Hart Bill require. The objective of Sections 115 and 131 is to enlist the aid of the inventor and the applicants and the attorneys in placing on the record the most pertinent prior art known to them and a full disclosure of all facts, pro and con, bearing on compliance with the statutory requisites. The proper role of the Public Counsel is to inquire into these matters on which the highest good faith is required.

The Public Counsel should be empowered but should not be required to review all proceedings in the U.S. Patent Office. His office should be entirely independent from that of the Solicitor, who should continue to bear the principal responsibility to oppose appeals of applicants from the various tribunals of the Patent Office. The office of Public Counsel should be completely independent from that of Commissioner except for purely administrative matters. The Public Counsel should be permitted to appoint all of the employees of his office. He should receive complaints from examiners and competitors of applicants and from the public at large. With regard to fraud or unethical practice or noncompliance with statutory requirements or breaches of ethics, he should be empowered to inquire into them and to intervene in any case before the Patent Office tribunals, representing the public interest. Generally he should

concern himself with cases involving fraud or unfair practice and his efforts should only supplement those of the Solicitor in the conventional defense of appeals, which generally involve the question as to whether or not the subject matter claimed is patentable over the prior art.

The Public Counsel must exercise a great deal of discretion and judicious restraint and should be sure that at least a *prima facie* case in favor of the public exists before he intervenes in any proceeding.

Most of the law relating to fraud and unclean hands is made in the Supreme Court or in the Circuit Courts of Appeals. It should be made in the Patent Office. There is presently no effective means for making it. The Public Counsel will supply the means. Clearly he cannot review all proceedings or intervene in all cases. That might require that his office have a staff as large as the examining corps. However, even operating on a spot check basis, his very presence will discourage misrepresentation and fraud, and litigation conducted by him will establish principles that will further discourage misrepresentation and fraud.

Heretofore the appellate procedure before the Patent Office Board of Appeals is invoked by the applicant. An excellent feature of the Hart Bill is the proposal that he may intervene in any Patent Office proceeding or intervene or appeal rulings therein. In other words, the Public Counsel, on behalf of the public, can now appeal if he is dissatisfied with allowance of a patent application by the primary examiner or a Board of Appeals. This will provide the public with machinery to uplift the standard of invention in the Patent Office so that patents issuing therefrom will have a better chance of vindication in court.

PUBLIC ADVERSARY HEARINGS—SECTIONS 122, 134, 135, 137, AND 138

The principle here involved is most commendable. The objective is to enlist the aid of the interested public and the relevant sector of industry in contributing to the examining process the maximum of intelligence and the optimum prior art picture. These sections require revision. It is suggested that not every applicant be subjected to what amounts to a full trial in the U.S. Patent Office. His case should not be published and laid open for opposition until it has been examined and tentatively allowed. At that stage it would be in order to consider, *ex parte*, any and all comments and reference material submitted by any interested party. Moreover, the Public Counsel could be brought in to ascertain if any public interest appears at that point. The interested party or opposer should not be permitted to intervene or participate in or set up an *inter partes* proceeding, bearing on the merits of the patent application, unless and until the Public Counsel determines, in a specific case, that such intervention would aid him in the performance of his function. In the majority of cases an *ex parte* consideration of data submitted by a potential adversary should exhaust the reexamination process.

A serious defect in opposition proceedings is in evidence in certain foreign countries. Many companies filing patent applications in those countries now simply assume that their competitors abroad will file oppositions, whether or not in good faith. The public Counsel should be given authority to ascertain whether or not data supplied by adversaries are furnished in good faith and to tax costs and penalties if they are not.

DEFERRED EXAMINATION—SECTIONS 191-193

The present practice of examining all patent applications is a prime reason why the examination is too often inadequate. This practice overlooks certain realities: that many patent applications are filed in order to establish dates on invention and set up defensive latitude for manufacturers who are not interested in licensing or like patent exploitation, and that some are filed for only potential use and others for bargaining purposes.

Under Senator Hart's proposal a patent application would not be examined on the merits unless and until the applicant visualizes commercial exploitation, a licensing opportunity, or some practical impact on the economy that would justify the payment of an examination fee. The applicant would have a five-year period of grace during which to make a request for examination and pay the fee. Upon failure to make it within the time limited, the application would

be abandoned. The Public Counsel or the Government or any interested person could call up the application for examination.

This proposal is not novel and it is controversial. However, it is an excellent proposal because it will enable the examining corps to concentrate its efforts on the patent applications that the applicants intend to exploit. Patent applications filed for defensive reasons or in an abundance of caution or for the purpose of building up numbers often become obsolete and die of their own weight within five years. They are akin to annual grasses as distinguished from perennials. The deferred examination process would operate in such a way that the Patent Office can concentrate its efforts on those inventions and patent applications which the applicants bona fide and seriously regard as important and intend to exploit. The proposal enables an applicant to safeguard his fundamental rights with respect to dates and the like, while he endeavors to profit by his invention. If he finds it unexploitable and fails to request examination prior to the expiration of the five-year period the patent application dies and the Patent Office has not gone through any waste motions in examining it.

MAINTENANCE FEES—SECTION 41

I respectfully submit that this section is unwise and erroneous both in its motivating philosophy and in its implementation. The theories behind this proposal are: (1) the Commissioner should adjust the filing and maintenance and issue fees so as to make the Patent Office primarily self-liquidating; (2) the inventor will be motivated to put his patent to work so that he can in due course pay the heavy maintenance fees or show cause to be excused; (3) the weight of the maintenance fees will act as a scavenger to cancel out those patents that are not contributing to the economy.

I respectfully dissent most emphatically from the concept that the United States Patent Office should be self-liquidating or even partially self-liquidating. Whatever the Patent Office annual budget is, it is one of the best bargains that the American citizen derives from his government. Whatever the budget is, it is minute compared to the contributions of the patent system to the American economy. The prime objective of the patent system is to stimulate invention, to persuade the inventor to come up with real contributions and to reward him for doing so. Nobel Prize winners do not pay costs of administration, nor do Congressional Medal of Honor winners, nor do fellowship winners.

The minimum filing fee is now \$65.00 and the minimum issue fee is \$112.00, as provided by statute. This burden on the inventor is already too heavy. The Hart Bill proposes to levy progressive intolerable maintenance fees on the patentee after the fourth year of patent life. If the patentee shows a bona fide but unsuccessful effort to work the invention, these may be waived, up to the tenth year. A discount in the filing and examination fees and a larger discount in maintenance fees is provided for individual inventors and small businessmen.

Again, there is reason to dissent very strongly from proposed legislation which, on its face, discriminates in favor of individual inventors and small businessmen. Filing and issue and examination fees should be fixed by statute and should be uniform.

The whole concept of maintenance fees is erroneous. These impose an undue burden on inventor and applicants. The individual inventor and the small businessman would be most injured. The erroneous theories behind the maintenance fee overlook patents on the late-blooming type of invention. I have in mind specifically the Farnsworth patent on the fly back power supply for home television receivers. The invention was far ahead of the art. It was not used except during the final two or three years of its life. When home television reception came into general acceptance, shortly after World War II, the Farnsworth invention made one of the greatest contributions thereto. A maintenance fee system would, at least by the end of ten years of patent life, have caused the patent to be cancelled, so that the inventor and his assignees would never have derived any benefit. But in thirty years of patent practice this is one of the most significant and meritorious inventions that I have observed.

Summarizing, maintenance fees are inconsistent with the objectives of the patent system. They deliver to the inventor an impaired gift horse. They penalize the inventor who is far ahead of the art. Worse still, the maintenance fee proposal herein contained would attempt to discriminate on its face in

favor of individual inventors and small business. It is fundamental that legislation should treat all alike. Reform of the patent system is not the proper occasion for social experiment.

THE PATENT OFFICE AS AN INDEPENDENT AGENCY—SECTION 2

During the years 1942-43 and prior to Naval service I was a junior examiner in the United States Patent Office. Under the then-current administration of Commissioner Conway P. Coe and for some time prior thereto the Patent Office was regarded as a model agency. The pay was poor. Armed with degrees in law and in electrical engineering and in liberal arts, I made \$2,000 per year. However, then, as now, the Patent Office had a veteran corps of able chiefs, solicitors, supervisors and board members. The various ethnic groups and majorities and minorities worked together in harmony. Service was rendered with enthusiasm and dedication.

Mr. Coe served in the office for about twelve years, resigning in 1944 or 1945. Since that time we have had at least nine commissioners. I suggest that, no matter how able or dedicated the director of an activity might be, you are not going to obtain continuity of policy or consistent improvement with this constant turnover.

The work of the U.S. Patent Office is *sui generis*. It has nothing in common with that of the Bureau of Standards or the various other agencies of the Department of Commerce. No reason is apparent why a man of the stature of Commissioner of Patents should be "second guessed" by an Assistant Secretary of Commerce. The need for this supervisory linkage simply does not exist. While there is reason to believe that the present Assistant Secretary of Commerce for technology will work effectively with the Commissioner of Patents (whenever a Commissioner is appointed) the proposal is a matter of organization principle and not of personalities. There are rumors that in the past some Assistant Secretaries have exerted pressure on the Commissioner of Patents to give priorities to foreign treaty activities and to emphasize employment by minorities and to become involved in other activities which may be good in themselves but are quite secondary to the main purpose of improving America's position in technology. These rumors may be unfounded but I would respectfully suggest that the Committee inquire into them.

The Patent Office performs one of the designated constitutional functions. The incentives that it offers are worthy of primary governmental attention. This should be recognized by making the Patent Office an independent agency. I believe that there will be less turnover in the office of Commissioner when the Patent Office is set up in this manner.

COMMENT ON MISCELLANEOUS SUBORDINATE FEATURES OF THE HART BILL

Article 23 with reference to discovery proceedings should be redrawn. It reflects the general tendency toward "overkill" in discovery proceedings. These weapons, in the hands of a not too scrupulous adversary can subject a victim to gross injustice, the costs of seeking judicial relief often being prohibitive.

Section 24 should be narrowed to confine the Public Counsel's work to cases and controversies and to preclude general fishing expeditions.

Section 31 should be amended in an effort to discourage the future registration of patent agents. There are so many night law schools that there is no compelling reason to license future patent agents.

Section 100(g) is mistaken in certain respects. Some of the best inventions arrive out of adaptation of old structure or substance to a new use.

Section 102 is too broad in its treatment of foreign usage. Public use or sale abroad should not discourage independent invention here.

Section 104 is misguided. Some of the best inventions are found in the perception of a problem, which, when announced, makes the solution look obvious.

As to Section 112, it would not be practical to set forth a range of equivalents in a specification. Independent claims should not be defined by statute. It is reasonable to make a specification include the dates of invention provided that the timing of the various Patent Office procedures is such that this will not give any advantage to an actual or potential interferent.

As to Section 114, applicant should not be required to furnish models.

Section 112 should be so modified that applications are not made available for public inspection or opposition until they have been examined or allowed, or until the Public Counsel has intervened and has determined that publication would then be of benefit to the public. Applicants should not be discouraged from filing patent applications for fear that their concepts and principles and business confidences will be revealed prematurely to competition and the public at large.

The examination proceedings should allow broadening of claims and Section 132 should be modified accordingly. Section 137, which permits any party to in effect provoke a trial in the Patent Office at any time is an "overkill" proposal. Any party should be permitted to state his interest and perhaps present affidavits and briefs, for consideration, during the examination process. But bona fide applicants with meritorious inventions should not be confronted with trials in the Patent Office on every occasion.

Section 201 is too broad in prohibiting reissues that enlarge the claims. While reissue applications in this category should be carefully scrutinized a flat prohibition is inconsistent with the basic reason for reissues.

As to Section 263 the problem of supplying motivation to the employed inventor should be subjected to a separate study. Individual award systems, set up by employers, are to be preferred to statutory fiat.

Section 1542 should be amended so that the new act would not be applicable to impose any additional restraints on acts of an alleged infringer of the precise kind performed prior to the effective date of the act.

Thank you, Honorable Chairman and Colleagues, for attention and consideration. I am at your service.

Respectfully submitted,

CHARLES M. HOGAN.

STATEMENT OF CHARLES M. HOGAN, GENERAL PATENT COUNSEL, AVCO CORP.

Mr. HOGAN. Mr. Chairman and counsel, this opportunity is very much appreciated.

I started out as a country general lawyer, and perhaps my point of view may be somewhat different than those that you have heard expressed. Thereafter, I was a junior examiner in the Patent Office. Then I went to work for the Hazeltine Electronics Co., which is a very active research and licensing company in New York. After that, into the military, and was assigned to the Bureau of Ordnance—Naval Bureau of Ordnance, then to work for a private patent law firm in Chicago. And for the last 26 years, I have been employed by Avco Corp., the last 7 as general patent counsel.

Avco is a diversified manufacturing company in the very forward van of technological research in several areas, particularly aerospace and laser technology.

My views are my own, and I am not authorized to speak for the company.

It would seem that the principal problem with which the committee is confronted is the quality of the examination in the U.S. Patent Office. The tendency is for the experience and expertise of the attorney to push the standard of invention down against the resistance of the relatively inexperienced junior examiner who very often is the examiner on the firing line. A young man out of engineering school who studies law in Washington and aspires to be a patent attorney may remain with the Patent Office 2 to 4 years, has limited or no experience in industry, views the invention disclosure as an academic thing, is interested in how it works and how it fits

into the prior art and has not the slightest idea as to the economic impact of the disclosure, before him, on industry.

The standard of invention is notoriously low, in view of the statistics relating to the invalidating of patents by the courts. Now, an invalid patent is analogous to weeds in the presence of a nice lawn. An effort to grow a lawn and an effort to encourage worthwhile inventions are handicapped by the presence of weeds and by the presence of marginal patents. In agriculture, growth is often achieved by judicious pruning, and the same would be applicable to the U.S. Patent Office.

We are not going to get any radical improvement in the quality of the examination by simple duplication of effort. The problem is to enlist the affirmative aid of industry and enlist the affirmative aid of the knowledgeable attorneys in the examination process. Let us bring to bear the aggregate of knowledge, pertaining to prior art, to a reasonable extent on the examination, not of every tidbit invention, but on every worthwhile advance. Let us concentrate selectively on the advances.

Now, then, how are we going to do this? First, we have to make up our minds that this is an objective that we seek. I have yet to see the Patent Office or the patent bar direct itself, as a primary objective, to the aim of the elimination of the chaff that exists in the work product of the Patent Office. The rationalization seems to be: I have to file this patent application because the client wants it. If I do not file the patent application, some other patent attorney will.

The analogue is somewhat related to domestic relations cases. Some lawyers justify taking a domestic relations case without investigation on the basis that if they do not, another attorney will.

Now, some patent applications are filed because, if the filer does not take the case, some other patent attorney will; some are filed to humor superior executives, senior engineers; some are filed for purely defensive purposes. That is widespread in the military. I daresay the primary motive for the thousands of patent applications that are filed on behalf of the military establishment each year, at least hundreds—I daresay that the primary motive is to safeguard latitude to make and use and otherwise practice an invention. The military establishment does not care what the scope of the received claims might be; any old claim will do.

We patent lawyers are tuned to understand each other. And when we look at the Gazette and see a one-claim patent in the Gazette, we often say to ourselves: From much coming, the examiner doth weary, and he issueth a patent with one claim and a red button that does nobody any harm.

That is a far cry from an incentive that we are offering to an inventor to promote, to induce, to persuade him to put his good ideas on the table, to come up with good ideas, to come up with great innovations, to help put our country on top technologically. It is a far cry from that ideal and is down to the bottom of the scale, when we say that this one-claim patent is not going to hurt anybody.

So that we need to dedicate ourselves to the objective of putting the best ideas on the table, getting them into the Patent Office, and

discouraging the chaff, discouraging the weeds, and doing the right amount of pruning.

Now, stage 1, the patent bar can do some pruning on its own. At this point, the Public Counsel principle is an excellent one. I would suggest that the Office of Public Counsel be treated as separate and distinct from the Office of Solicitor. The usual procedure now is for the Solicitor of the Patent Office to appear before the courts to oppose the issuance of patents that he considers to lack invention.

Now, these cases generally involve the issue of invention vel non—based on the prior art on the record. Now, the Solicitor's office is eminently competent to perform that function, and it should be maintained.

But the issue of invention vel non, which is a give and take issue, is not the only one that is before the Patent Office. Many issues are before the Patent Office, but they are really hidden. Is the best art on the record? Is this patent application affected by public use? Is this patent application affected by some other bar?

These things prompt inquiry on behalf of the public. Who is going to perform that function? That is the job of the Public Counsel. There is no need whatsoever to double the examining corps of the Patent Office. The Public Counsel can have the same type of influence on the administration of patents in general as a lovely, charming lady in the classroom does. She keeps the boys on their good manners; they dress up and behave themselves.

By the same token, the presence of the Public Counsel making an occasional spot check, looking into cases of complaint, looking into cases that have obviously a great impact on the economy, looking into suspicious cases, making spot checks—his very presence is going to greatly elevate the candor with which patent applications are prosecuted.

That is particularly the case when, in addition to the charming young lady in the classroom, statutory standards of conduct are coupled with the existence of the Public Counsel, with the requirement of a citation of art and the requirement of a brief of patentability, and the probability is that most of the pertinent facts will come before the Patent Office is much higher than in this climate of unilateral prosecution that we classically have.

Senator HART. At that point, Mr. Hogan, let me get over for another vote. I will be back in about 10 minutes.

[A brief recess was taken.]

Senator HART. We can proceed.

Mr. HOGAN. Senator Hart and counsel. I will be brief because we are waiting to hear from Mr. Pederson. We need to take heed of the fact that at one time our statute said that "the Commissioner of Patents shall issue a patent on the disclosure if it be sufficiently important." It is regrettable that those words "sufficiently important" were taken out of the statute.

The German patent office has an attitude that we American patent attorneys occasionally run into. One of the gentleman before this committee made the statement—I believe it was Mr. Irons—that if anything were novel a patent attorney can get a patent on it in this country.

That statement might be modified slightly, but it is pretty generally the case. The statutory requirements are novelty and nonobviousness or inventiveness; but it comes pretty close to being the fact that the prospects of an able advocate obtaining a patent on a disclosure that is characterized by novelty only are pretty inviting.

I would be willing to put my money on the patent attorney to succeed rather than to fail—to succeed many more times than to fail. The German patent office confronts that approach with their reaction: "Everything that you say, counsel, about the red button and the remarkable accomplishments, and this thing being painted blue, might be true, but we are not going to give you a patent on it. It is beneath our standards." We can profit by emulating the attitude of the German patent office in that respect.

Now then, the public adversary hearing is going to bring out the views of industry on the patentability of certain patent applications. I would advocate that a patent application not be laid open for any kind of opposition or any kind of public adversary hearings until it is in an allowed state. I would advocate that the patent application not be published until it is in an allowed state, and that a considerable time elapse between the filing and the publication.

I would advocate that the reexamination be confined to simply the reference material and the arguments that were turned up on the applicant's prosecution without giving the adversary or the opponent an opportunity to appear, make a trial out of it, or make arguments.

I think that if we are going to make trials in the Patent Office, it would be too much of a burden on the inventor in the ordinary case. An exception might be made if, in the opinion of the public counsel, irregularities are appearing, or the importance of the case is such as to justify calling in the adversary and opening up a wholly adversary proceeding.

Now then, on this matter it is a serious defect of opposition proceedings that they are often brought as a matter of course in foreign countries. Some companies know that every time they file an application in certain foreign countries, the competitor will automatically oppose, whether in good faith or not. Certainly, it is not desirable to open up to that type of opposition.

The opportunity for the public to be heard, to submit data, to be considered *ex parte* by the examiner, that is fine. In an exceptional case, to have a public counsel call in the adversary to participate, so much the better.

Now then, the case for deferred examination has been argued against on the theory that we do not need it here. There is no need to defer anything. We are up to date. Well, what are we up to date with? We are up to date with a poor, with an inadequate quality of examination.

The foreign art has not adequately been looked into. It is not adequately classified. I was a patent examiner. I did not know the first thing about making a literature search until I got a Master's degree in history, years after I finished working in the Patent Office. The average examiner does not make a literature search; he does not

know how. So that the quality of the search in the Patent Office is not adequate.

Why is it inadequate? It is inadequate because the examiner is overburdened, and he is on a quota system, because he is examining the chaff as well as the wheat.

The value of deferred examination would be that it would put the wheat before the examiner for examination, and it would temporarily put the chaff in storage where it belongs.

As to maintenance fees I am afraid, gentlemen, I am dated: Congressional Medal of Honor winners do not pay costs of administration: Nobel Prize winners do not pay costs of administration. Even if the patent system is not serving its real objectives in an entirely approved way, it is serving them generally. A patent of real benefit to the economy justly deserves an award or prize. This country badly needs the Patent Office, whatever it costs. The costs are a drop in the bucket compared to the advantages that the patent system, even as it is now, is bringing.

Now, with a proper scheme of examination and a minimizing of the chaff that is cluttering up the courts in patent litigation and constituting a briar patch for productive industry, the cost of the Patent Office would be a very minute consideration compared to the benefits.

I would advocate, if money has to be derived any place, that it be derived from final fees because at that time the man has the prize in front of him, he has run the race; a few hundred dollars does not hurt him so badly.

The Patent Office should be an independent agency. Its function is one of those specifically enumerated in the Constitution. We have, I believe—Commissiciner Watson stated that we had something like 40 independent agencies.

Certainly the patent function in this day and age when we are being seriously threatened as to economic supremacy and technical leadership by the Soviets, and by Japan, and by West Germany, and others certainly, the performance of this function is one of the very highest dignity.

The Patent Office is not a place for a social experiment. It is not a place for pushing treaties before getting the patent system improved domestically. It is no place for rapid turnover. The patent system ought to be separated out from the Department of Commerce and put on its own. Certainly, the specifically enumerated constitutional function, from the very beginning, deserves no less.

Thank you very much, Senator Hart and the committee.

Senator HART. Thank you, Mr. Hogan. That was very interesting.

One of the items that was not enumerated in the list of five—and I am probably breaking the rule by asking about it. I should have remembered this morning to ask others about it when we talked about reforming the patent system, the need for which you very effectively underscored.

What is your reaction to specifying antitrust ground rules for licensing patents as part of patent reform? Forget for a minute the political problems that this creates. Think of it as a question that asks for an answer based on the question alone, and without any

consideration as to whether it hangs up the forum here or does not hang it up ideally.

Do you see the relationship between reforming the patent system with respect to issuing patents and spelling out the antitrust rules for the licensing of patents as one and the same?

Mr. HOGAN. No, sir. I cannot see any relationship between the two problems whatsoever. It seems to me that our problem now is to get good inventions, better inventions technologically and work our way out of a mess with the ecology, out of a lack of adequate growth, out of our inflation. It is to get these inventions now. I do not know anybody with a good invention who has a present antitrust problem.

Senator HART. This morning we played around with figures, and certain witnesses suggested 100,000 patents are issued, 70-odd percent of those challenged are found to be faulty, but only one percent of the 100,000 are challenged. What is the conclusion?

Do you want to put any figure on how much of the 99 percent would be weeds if litigated?

Mr. HOGAN. Senator, I would venture that—it would be difficult to say. I would venture that most of the 99 percent are not used. The patent that is challenged in court is likely to be—well, not necessarily. I was going to say that it was likely to be weaker than the mean. I am not so sure of that because the patent that is challenged in court may involve large sums, and when large sums are at stake it is worth the defendant's while to resist and to subject it as it were to the ordeal by experts that some patent cases are becoming.

I would find it difficult to project that average, the statistical average of patents held invalid, over into the mass of patents, as far as validity is concerned.

Now, I daresay that the mass of patents are not used, so that the question of validity is not likely to come up. Many are obsolete; sometimes they are abandoned. Sometimes the inventor does not have the business acumen to develop them. For a variety of reasons they simply die.

I am inclined to think that most of them lack an adequate citation of prior art, and most of them are vulnerable to attack in the courts. So vulnerable that defendants I daresay in most cases can make a bona fide case. I will go that far. I say most of them are vulnerable; probably the majority are vulnerable to a bona fide attack in the courts.

Senator HART. Mr. Brennan.

Mr. BRENNAN. I would like to pursue the chairman's first question, which makes us both guilty of going outside of the ground rules.

The current exercise in reforming the patent system began with the report of President Johnson's Commission on the Patent System. Is it not correct that the proposal to clarify the law with respect to patent licensing was contained in the report of the President's Commission?

Mr. HOGAN. I am not certain of that. I think it was, Counselor Brennan. I am not sure whether that is the case or not.

Are you saying that the subject matter—the amendments were in the recommendations of the Commission?

Mr. BRENNAN. I am saying that one of the recommendations of the President's Commission, No. 22, recommended that the Congress, by statute, should clarify the law with respect to patent licensing. And if that statement is correct, then the two issues have been linked together since inception or conception.

Mr. HOGAN. Mr. Brennan, the President's Commission made so many mistakes, I would not arrive at any solid conclusion on that basis.

Mr. BRENNAN. I am not debating with you the recommendations. I am only asking you a factual question as to what was the recommendation.

I would suggest, Mr. Chairman, it might be useful to have inserted at this point, if it is agreeable to you, that excerpt from the report of the President's Commission.

Senator HART. We will let the recommendation No. 22 and the accompanying explanation be printed at this point.

[The information referred to follows:]

XXII. The licensable nature of the rights granted by a patent should be clarified by specifically stating in the patent statute that: (1) applications for patents, patents, or any interests therein may be licensed in the whole, or in any specified part, of the field of use to which the subject matter of the claims of the patent are directly applicable, and (2) a patent owner shall not be deemed guilty of patent misuse merely because he agreed to a contractual provision or imposed a condition on a licensee, which has (a) a direct relation to the disclosure and claims of the patent, and (b) the performance of which is reasonable under the circumstances to secure to the patent owner the full benefit of his invention and patent grant. This recommendation is intended to make clear that the "rule of reason" shall constitute the guideline for determining patent misuse.

There is no doubt, in the opinion of the Commission, of the importance to the U.S. economy of both the U.S. patent system and the antitrust laws. Each is essential and each serves its own purpose within the framework of our economic structure. However, conflicts between the two have arisen. But this does not mean that the two systems are mutually exclusive, that a strong patent system is a threat to the antitrust laws, or that the latter cannot be effectively enforced so long as a patent system grants limited monopolies.

On the contrary, the two systems are fully compatible, one checking and preventing undesirable monopolistic power and the other encouraging and promoting certain limited beneficial monopolies. In this way, each may easily achieve its objectives in a strong economy.

The Commission, therefore, does not favor any proposal which would weaken the enforcement of the antitrust laws or which would curtail in any way the power of the courts to deny relief to a patent owner misusing the patent he seeks to enforce. However, uncertainty exists as to the precise nature of the patent right and there is no clear definition of the patent misuse rule. This has produced confusion in the public mind and a reluctance by patent owners and others to enter into contracts or other arrangements pertaining to patents or related licenses.

No useful purpose would be served by codifying the many decisions dealing with patent misuse into a set of rules or definitions permitting or denying enforceability of patents in given circumstances. The risk of unenforceability is too great and such a codification is wholly unnecessary. All that the Commission believes to be required is explicit statutory language defining, for the purpose of assignments and licenses, the nature of the patent grant heretofore recognized under the patent statute or by decisional law. This is, the right to exclude others from making, using and selling the patented invention.

The mere exercise, conveyance or license of these conferred rights should not in itself constitute misuse of a patent. A patent owner should not be denied relief against infringers because he either refused to grant a license or because he has exercised, transferred or licensed any of the conferred patent rights

himself. This should not include immunity of even these conferred patent rights from the antitrust laws when the patent owner becomes involved in a conspiracy to restrain or monopolize commerce, or when the patent is itself used as an instrument for unreasonably restraining trade.

There are also a number of conditions and provisions long associated with the transfer or license of rights under patents which must be distinguished from the exclusive right to make, use and sell conferred by the patent grant. Among these are improvement grant-backs, cross licenses, package licenses, patent pools, no contest clauses, and many others which are simply matters of private contract, ancillary to the conveyance or license of a patent right. As such, these conditions and provisions must be judged, along with other purely commercial practices, under the antitrust laws and the patent misuse doctrine. The Commission does not recommend immunization of any of these other provisions or conditions from either the antitrust laws or the application of the misuse rule.

This recommendation also makes it clear that a patent may not be used to control commerce in subject matter beyond the scope of the patent. For example, it could not be considered "reasonably necessary" to secure full benefit to the owner of a machine patent that he attempt to control any of the commerce in an unpatented raw material to be used in the machine. Neither could it be held that such an attempt had a direct relation to the machine claims in his patent. By the same standards, the patent owner could not control commerce in one of the unpatented elements of his combination invention where his claims are to the whole combination.

MR. BRENNAN. I want to compliment you for an extremely effective presentation. I think it is one of the best I have heard over a period of time.

MR. HOGAN. Thank you, sir.

MR. BRENNAN. In your prepared statement you indicate there is criteria that ought to be employed by the Office of Patent Counsel in deciding what cases they ought to explore.

Do you contemplate having this criteria set forth in the statute, or would this be left to the discretion of the Office of Public Counsel?

MR. HOGAN. Counselor, I would despair—Senator and Counselor, I would despair of the possibility of perfection in this. I would advocate setting down some criteria, yes.

It seems to me that in some of the constitutions of some of the States there are set forth criteria defining cases of great public interest, cases that their supreme courts, courts of last resort, should consider on certiorari. They indicate that it is practical for legislative draftsmen to think up worthwhile criteria.

I think that is an excellent thought, that the criteria be set forth in the statute; that it should be the exceptional case for public counsel to get into.

MR. BRENNAN. Thank you.

MR. HOGAN. Analogous to the certiorari process; analogous to the censor—I do not like to use this word—but under the Chinese emperors they had a censor. His job was to see what was going on wrong in the government.

This public counsel has to be a most discreet, judicious person and must conduct his office in a most discreet way. I like the thought that has been expressed and would certainly advocate that statutory criteria be employed to define this discretion; also that he be totally independent of the Commissioner and the Solicitor; he is a watchdog.

Senator HART. It is not just patents; it is everything. When you have an idea that it would make good sense to have someone playing

that kind of role, you always argue that there are plenty of people that have those qualities. But then if the notion offends you, then you are always suggesting that that is a very rare breed and you cannot assume you will get that kind.

Even with statutory guidelines there would be a sincere argument made that the odds would be against finding a person of that quality.

Since I would think it would be desirable to have that office, I would argue that you would be very likely to get that kind of fellow.

Mr. Nash.

Mr. NASH. No questions.

Senator HART. Mr. Hogan, thank you so much.

Mr. HOGAN. Thank you very much, Senator. Thank you, counselor.

Mr. BRENNAN. Mr. Chairman, the last witness is Mr. John Pederson.

Senator HART. Before you begin let me thank you for your willingness to change your schedule to accommodate the committee.

Mr. PEDERSON. Senator, I appreciate the opportunity to appear. It is the least I can do.

Mr. BRENNAN. I assume we will have the statement printed in full at this point?

Senator HART. Yes.

[The prepared statement of John Pederson follows:]

STATEMENT OF JOHN J. PEDERSON CONCERNING S. 1321

Mr. Chairman and Members of the Subcommittee, my name is John J. Pederson. I am General Patent Counsel and Director of Patents for Zenith Radio Corporation, a major producer of radios, television sets and related consumer products.

I am here today because of my firm belief in the wisdom of the constitutional provision for a patent system to promote progress in science and the useful arts and because I recognize the urgent need for patent reform if this basic constitutional purpose is to continue to be served. One need only look to the patent invalidity statistics in Federal court litigation—more than 70% of the litigated patents are held invalid—to know that extensive reform is needed to provide enhanced credibility for patents.

While there are specific provisions in the Patent Reform Act of 1973 (S.1321) which I believe to be unworkable or impracticable as presently drafted and others which in my view are unwise, I believe that as a whole this draft bill constitutes a bold and imaginative effort to provide the reform which is so sorely needed. The bill is designed to enhance the credibility of patents by augmenting the present and traditional ex parte patentability proceedings with adversary proceedings which are better adapted to elicit the relevant prior art and to apply the statutory patentability standards. From my 25 years of practice before the Patent Office, I have come to the firm conviction that the establishment of an adversary system is absolutely essential if the credibility and integrity of U.S. patents is to be restored. In many cases, only the applicant's competitors or other potential users of the invention upon which patent protection is sought are in a position to identify and bring forward the most relevant prior art against which the statutory requirements of novelty and unobviousness are to be measured. Neither the applicant nor the Patent Office Examiners have an effective basis for identifying specific prior art in the category of subject matter in public use or on sale (Section 102b), to say nothing of that embodied in unpublished pending patent applications (Section 102e) or that falling in the category of unpublished prior knowledge or use by others (Section 102a). But a competitor or an industry member who has possession of such unpublished prior knowledge, or who owns the unpublished pending patent application, or who has produced or sold a product

embodying the invention, can identify this relevant prior art with relative ease. The present law makes no provision for using these channels to identify the most relevant prior art in the Patent Office examination proceedings. It is only by permitting competitors and industry members to oppose the patent grant that this can be achieved.

However, it is not enough to provide a vehicle for permitting competitors and industry members to come forward in opposition to the patent grant. The opposer as well as the applicant must be given an equal opportunity for argument and for appeal of erroneous Patent Office decisions, and failure to oppose when proper grounds for opposition exist must carry sufficiently serious consequences to assure proper use of the opposition system. If a competitor or industry member has nothing to lose by standing off, in the sense that he can make the same defense in court later if called upon to do so, many oppositions that should be brought will not be brought, and spurious patents will continue to issue.

On the other hand, safeguards must be provided to protect an applicant against oppressive abuse of the opposition process. An applicant with a good invention should not have to withstand the delay and expense of defending against specious oppositions filed with the purpose of inducing settlement on the basis of a royalty-free or reduced-royalty license, or with the hope of inducing abandonment to avoid heavy defense costs, nor should he be deprived of his "day in court" because he cannot afford such legal expenses.

To satisfy all of these criteria, an ideal opposition system should contain built-in effective sanctions against misuse or abuse of the opposition process, should provide at least some measure of incontestability or increased credibility for the patent which survives, and should contain provisions for financial assistance in connection with legal services in cases of proper need. Failure to satisfy these conditions can so distort the system as to frustrate the constitutional purpose of promoting progress in the useful arts and sciences.

The Patent Reform Act of 1973—S.1321—provides a basis for opposition proceedings from which the opposer as well as the applicant has effective appeal remedies, and it also contains other provisions designed to compel the applicant to identify relevant prior art known to him and to provide the Patent Office with both system and procedure for eliciting a better overall knowledge of the relevant prior art, but it does not provide any specific benefit to the successful patentee or detriment to the unsuccessful opposer, it does not contain effective sanctions against oppressive misuse or abuse of the opposition process, and it fails to provide financial or other assistance to the applicant who cannot afford the burden of defending either a specious or a bona fide opposition. Moreover, there is additional inequity which may deter inventors from using the patent system for its intended purpose. As presently drafted, S.1321 contemplates publication of the application in advance of any preliminary examination or determination of *prima facie* patentability. Since a patent is a quasi-contract between the inventor and the government—a disclosure in exchange for a limited-term monopoly—any statutory requirement for public disclosure in advance of a *prima facie* patentability determination would be unfair and even arguably unconstitutional.

There are ways in which the present draft bill can be strengthened to overcome these objections. A prospective opposer may be required to make a *prima facie* showing sufficient to establish probable cause for instituting the opposition, before the applicant is subjected to the burden of such a proceeding. An unsuccessful opposer may be required to bear the applicant's costs of defending the opposition. A substantial opposition fee may be imposed on the opposer at the time of filing the opposition. All of these measures would reduce the likelihood of specious proceedings designed for harassment or shake-down purposes. On the other hand, unless there is some serious consequence of withholding a bona fide opposition, all of these other provisions would tend to discourage competitors or industry members from coming forward during the examination process. To overcome this negative bias, and to provide for the integrity of issued patents which withstand the opposition process or go to issue without opposition, a really strong presumption of validity must be established. This can be done in various ways but in any event, to be effective, the statute must give more than mere lip service to the presumption of validity. Total incontestability would serve the purpose but would be found by most

to be too harsh if not unconstitutional. However, there would seem to be no good reason why a competitor or an industry member having actual grounds for opposition at the time the application is published should not be estopped from contesting validity on the basis of such grounds if he elects not to bring the opposition. A middle-ground approach, which I have not seen advanced elsewhere, and which has the advantage of being more objective in nature than personal estoppels, might provide for the unavailability of Section 103—the unobviousness section—as a defense against patents surviving the opposition process or issuing without opposition; this would leave Section 102—the novelty requirement—as well as other technical defenses open to all. Especially in view of the inclusion of Section 138(b), a separate section should be incorporated to define the scope of the enhanced presumption of validity and the consequences of failing to oppose or of unsuccessful opposition.

And finally, for the independent inventor or the small business unable to afford the burdensome costs of defending patent oppositions, partial or full subsidization of legal expenses, on the basis of need, might be provided. Incidentally, this might also be made available to a needy opposer as well as a needy applicant.

S.1321 also includes provisions for enhancing the presumption of validity by establishing the Patent Office as an independent governmental agency, by providing Public Counsel in the Patent Office to argue for the public interest, and by providing for greatly improved library and mechanized search facilities. These are laudable measures when provided to augment the availability of inter partes proceedings instituted by competitors or industry members; in my opinion, they would not be sufficient of themselves without also providing for such opposition proceedings.

Section 135 of the draft bill provides for notification proceedings whereby any person, whether or not he may be adversely affected by the grant of a patent, may bring prior art to the attention of the Patent Office in connection with a previously published pending application. The person making the notification may, if he so elects, remain anonymous or he may elect to participate in the examination or re-examination proceeding as a party. I do not believe it appropriate for uninterested persons to serve in the capacity of private attorneys general, as the section would seem to permit, but in other respects I favor the provisions of this section. I do think, however, that if an office of Public Counsel is to be established, at least the anonymous notification proceedings should be routed through the Public Counsel's office, and the Public Counsel should be required to argue the patentability question before the Primary Examiner; otherwise the Primary Examiner's patentability determination may still be strictly ex parte and none of the benefits of adversary proceedings will be realized.

While on this subject, I would like to address the patentability brief requirement (Section 131) and the attorney's oath requirement (Section 115). Much opposition has been voiced against provisions of this sort because they are burdensome and, some say, demeaning to the legal profession. Nevertheless, if such measures will improve the credibility of the patent system, they should certainly be adopted. However, the establishment of an opposition system as well as the Public Counsel provisions and the mechanized search provisions are all addressed to the same purpose and are much better adopted to achieve that purpose than the patentability brief and attorney's oath requirements. As pointed out earlier in this statement, it is literally impossible for an applicant or his attorney to know of all of the relevant prior art in a given case. A patentability brief or an attorney's oath is no better than the knowledge upon which it is based. The cumulative knowledge of competitors and other industry members and their ability to identify relevant prior art is much greater than that of the applicant and his attorney, and the institution of an effective opposition system may be expected to bring to the surface all of the relevant prior art which could reasonably be expected to be identified in any patentability brief or attorney's oath, and more. In other words, I believe that an effective opposition system meeting the criteria set forth in my foregoing comments would obviate the necessity for a patentability brief or attorney's oath, and that elimination of these requirements would serve the constitutional purpose better by reducing the burden and therefore the cost of required legal services in connection with the filing of patent applications.

Another major reform measure under S.1321 would be the institution of deferred examination (Chapter 18). The deferred examination proposal is patterned after those adopted in other countries. The concept is that some substantial percentage of applications relate to subject matter which will ultimately fail to achieve commercial significance, and it is wasteful of the patent examining facility to subject such applications to the same examination procedure as applications directed to commercially significant subject matter. I understand that the expectation is that something in order of 50% or more of the applications filed would never require examination, and that this would make it possible for the examining corps of the Patent Office to do a more thorough job of examining the significant applications. At the same time, deferred examination would also result in a comparable reduction in opposition activity, for the application which is never examined need never be opposed.

I favor institution of the deferred examination procedure, but only if deferral is not accompanied by extension of the patent term. An applicant should not be permitted to prolong the patent monopoly by simply being dilatory. Rather than a term of 12 years from the filing date plus any deferral period as under the draft bill, or 17 years from the issue date as under the present statute, a term of 18 or 20 years from the filing date would seem most appropriate.

S.1321, if enacted, would institute for the first time in the United States a system including the imposition of annual maintenance fees to keep a patent in force. The principal reason advanced in support of the maintenance fee concept is to encourage lapsing of insignificant or commercially unimportant patents. However, the vast majority of patents issuing today are granted to corporations rather than to individual inventors. I believe the overall proportion is something in the order of 80%, and in high technology industries such as the radio/television industry, I am sure the percentage is much higher. Major corporations maintaining substantial patent portfolios will not be deterred from seeking or maintaining such portfolios, or induced to seek fewer patents, by the imposition of maintenance fees unless such fees are so high as to be confiscatory with respect to individuals and small companies; the constitutional purpose of the patent system will not be served by so favoring major corporations. Moreover, even if the maintenance fee system worked ideally as intended, only dead wood would be eliminated, and dead wood has not been a major problem. Lapsed patents, while no longer available for licensing or infringement litigation, could not simply be expunged from the records because they would still constitute a substantial portion of the body of prior art to be examined with respect to new inventions; in other words, the imposition of maintenance fees to encourage the lapsing of monopoly rights on inventions without commercial significance would constitute a solution looking for a problem.

It is not the purpose of this statement to identify all of the specific provisions that are either well or poorly adapted to the specific purposes of patent reform nor to propose detailed changes to improve workability or effectiveness. There are many individual provisions which will require major changes in the practice and which will draw heavy fire from the patent law profession; my view is that we patent attorneys can effectively adapt to most of them. In this category are discovery practice, universal prior art, public appeals, prohibitions against broadening of claims by reissue, more stringent disclaimer requirements, and others. The bill also contains uncontroversial changes which are clearly desirable, such as assignee filing, easing of technical requirements concerning joinder of inventors, measurement of the patent term from the application filing date, and pre-issuance damages for infringement based on a finding of allowability. Two sections, however, are both unwise and unworkable, in my opinion. These are Section 112 on disclosure requirements and Section 263 on the rights of employee inventors.

Under the present statute, Section 112 sets forth the basic requirements for the disclosure to be made in the patent specification. The first requirement is that of making an enabling disclosure, i.e., a disclosure which is sufficiently complete to enable those skilled in the art to make and use the invention. Secondly, the present Section 112 requires that the disclosure include a description of the best mode known by the inventor of making and using the inven-

tion. Over the years there has developed a large body of judicial precedent to assist in interpreting the detailed scope of these requirements.

Section 112 of the draft bill carries forward these requirements but also expands greatly upon them in several respects. The proposed Section 112 requires a listing of specific invention dates for each claim, including reduction to practice dates. It requires a description of all know-how required to use or commercially exploit the invention. It requires a specific definition of the range of equivalents to which any element of the claim shall be entitled to extend. These new requirements are obviously onerous, and in many instances are even impossible of fulfillment as a practical matter. For example, it may seem simple in principle to ascertain an invention date or a date of reduction to practice, but a little library work will readily show that what constitutes an invention date and the rules for determining the same are complex and involved and not without conflict of authorities. One of the rules, for example, is that no conception or reduction to practice can be established without corroborating evidence by some one other than the inventor. Indeed, the determination of invention date in contested cases requires long and involved interference proceedings. Accordingly, any requirement to specify invention dates in the specification is obviously totally unrealistic and unworkable.

The proposal to require inclusion of all know-how relating to the practice of the invention, even if the metes and bounds of such know-how were subject to such definition, would greatly expand the volume of written material in patent specifications with respect to any invention as to which such know-how has been developed. And the requirement for an express definition of the range of equivalents to be accorded to claim elements amounts to requiring omniscience on the part of the inventor with respect to future developments in the art as well as presently available alternatives for such elements. The whole purpose of the doctrine of equivalents is to recognize that an applicant cannot be all-knowing about available substitutes for components of his inventive embodiment and that as a matter of basic equity he should be entitled to cover other embodiments, even unvisualized ones, which utilize the inventive teaching upon which his patent is based. A hypothetical example or two may help to clarify this. One element of the claim combination may be a fastener. There may be absolutely nothing new or inventive about the fastener itself and just what type of fastener is employed may be totally immaterial to the realization of the inventive results and benefits. The inventor in his application may show a nut and bolt as the fastener. He may recognize and state in his specification that there are many types of fasteners that may be used instead, and may even give a couple of examples such as a rivet and a weld. But there are many, many types of fasteners known to man. Indeed there are literally thousands of fastener patents, many expired, to say nothing of other publications and commercial products. No purpose would be served by making the inventor list each and every one of them under penalty of making his claim avoidable simply by using an unspecified type of fastener. And no benefit would accrue to the public by making him list all known types of fasteners in his description. Indeed such an itemization would serve only to obscure the disclosure of the invention, which is a combination of many elements of which the fastener is only one.

As a second example, an inventor of an electric circuit using vacuum tubes in 1940 could certainly not know in advance that within the next ten years the transistor would be invented as a vacuum tube substitute, and indeed that the technical community would come to recognize that as a general rule any known circuit using a vacuum tube amplifier could be converted to a transistorized equivalent by following simple recipes which would be developed right on the heels of the basic transistor invention. Consequently this inventor could not possibly specify the transistor as coming in the range of equivalents to be accorded to the vacuum tube amplifier recited in the claim. And yet anyone making, using or selling the transistorized counterpart circuit ten years later would be realizing the full benefit of the invention.

In Section 112(d), there is a provision which would purport to restore the pre-1952 doctrines concerning "aggregation" and "old combination". It was to eliminate great confusion that had sprung up in the application of these very same doctrines that Section 103—the unobviousness section which is carried over in the draft bill—was developed for the patent act of 1952. Here again, we have had 20 years and more of judicial interpretation of the meaning of

Section 103, and to revert now to the antiquated doctrines of old combination and aggregation would undo all that progress.

For these and other reasons, I respectfully urge that Section 112 be carried over from the present statute unchanged at this time. To the best of my knowledge, there is no experience with similar legislation elsewhere. If experience under the new Patent Reform Act should reveal a need for extraordinary disclosure requirements, that can and should be taken up as a separate matter.

Section 263 would require an employer of a patentee to share savings or royalties with the employee/inventor even though the invention was made with company facilities, on company time and at company expense as part of the employee/inventor's employment. There are several basic objections to this provision and also to the similar laws which have been enacted in Germany and elsewhere.

First and most important, such a requirement could, and would be expected, to result in a competitive disadvantage to the originating company, and would therefore tend to stifle corporate research and development. It would have this effect because the patent would be conclusively presumed to be valid for purposes of profit sharing with the employee/inventor, but the employer's competitors would be free to challenge validity and, in at least some cases, to copy the product without suffering any cost burden whatsoever on account of the patent.

Secondly, a provision of this sort is totally unfair to other employees whose extraordinary contributions to the company do not fall within the category of patentable subject matter and would therefore not qualify for profit sharing or royalty sharing as an employee/inventor under this section. Employees in marketing, advertising, manufacturing, financial, legal, personnel, and other corporate functions are expected to make major contributions without profit sharing or royalty sharing, and I see no reasons for favoring the employee/inventor in this way.

Thirdly, a profit sharing requirement would not even reward the employee/inventor whose patentable contribution is not in the nature of cost saving but rather in providing improved performance at the same or even higher cost.

Finally, I can visualize no equitable way to allocate royalty sharing or profit sharing between several employee/inventors each of whom has originated a patent on some aspect of the product or its manufacture. A color television receiver, for example, may embody literally dozens of patented inventions each of which is addressed to some specific aspect of the receiver or to one of its components or sub-assemblies. Some of these patents are addressed to circuits or systems embodied in the product, others to construction of components, and yet others to manufacturing processes or improvements on such processes.

In closing, my commentary with respect to S.1321 would not be complete without noting that the draft bill contains no provision purporting to define licensing rights—nothing like the controversial Scott Amendments proposed in connection with predecessor bills. In my view, this is another commendable feature of the bill. Such proposals are founded on the premise that the patent system is primarily designed to reward the inventor, whereas the primary purpose of the patent system is to create a public benefit, namely to promote progress in science and the useful arts, and the inventor's reward is merely a means to that end. I see nothing about the patent property which should make it any more or less susceptible to misuse in violation of the anti-trust laws than other types of property. I therefore see no reason for attempting to carve categorical exemptions or immunities for patents from application of the anti-trust laws by statutory enactment.

The 1966 Presidential Commission recommendation to enact licensing rights legislation was accompanied by the statement that "The Commission . . . does not favor any proposal which would weaken the enforcement of the anti-trust laws or which would curtail in any way the power of the courts to deny relief to a patent owner misusing the patent he seeks to enforce." In other words, the recommendation was to clarify or codify existing law, not to reform or amend it. The difficulty which has been encountered in drafting acceptable statutory language to meet this objective was not visualized by the Commission, and I see nothing in its Report to suggest that the licensing rights question is not severable from the need for patent reform. The controversy over

licensing rights legislation has now delayed the much-needed patent reform for several years. In my view, it is a severable question and should be taken up separately without delaying the present bill.

To summarize my views concerning S. 1321, important revisions are needed and some provisions should be omitted altogether, but with appropriate changes it can be made a useful and effective patent reform measure.

STATEMENT OF JOHN J. PEDERSON, DIRECTOR OF PATENTS, ZENITH RADIO CORP.

Mr. PEDERSON. Mr. Chairman, my purpose in appearing is because of deep concern over the obvious need for a basic change and reform in our patent system. We all bemoan the vital statistics that we do have as to the mortality rate of patents in the court. I think from that it is fair to conclude that the patient is sick.

In partial response to a question asked of Mr. Hogan, I do not think you can extrapolate those figures and state the same percentage would apply to all patents. I do not think there is any way of guessing which way it would go.

But in any event there is need for this change and a need for reform; and it is time that we do it.

In my view the problem with the patent system has been inherent in the fact that all the patentability proceedings are and historically have been ex parte administrative proceedings; and what we need is an adversary system.

Now, I do not mean to imply that the Patent Office's examining corps is not an able and dedicated group of people. I think they are, and much has been done in recent years to upgrade their professional status and professional ability. There has been the institution of the Patent Office Academy. There are many more career examiners today proportionately than there were when I started in the practice 25 years ago; and they are doing well.

The problem we have is not the problem of professional accountability and dedication. It is a problem of difficulty with the system. The system is not well tailored to produce good patents and reject inferior patents.

As a practical matter, nobody can run a search on the basis of the amount of time allocable to an individual patent application to determine all the relevant prior art, even from among the library of prior art that is available to be researched.

But even of greater significance is the fact that there are entire categories of what often turns out to be the most relevant prior art, namely copending patent applications which represent the most recent innovation in the field to which the application we are talking about is directed. And they are not accessible to the examiner or to the applicant, and there is no way that they can be found as a part of an ex parte examination practice.

In an adversary proceeding, the applicant in these relevant copending applications could bring them forward as grounds for opposition.

A Patent Office examiner cannot identify them. He is prevented by statute. The applicant cannot have access in any kind of search. He cannot find them. And so, he is helpless to ascertain at the time he files his application what the real state of the prior art is.

I might also say in recent years the Patent Office has, I think, been pennywise and pound-foolish, probably in response to budgetary restraints, in curtailing search facilities; for example, it is no longer possible to run a decent search of the foreign patent literature in the U.S. Patent Office. It used to be that they had a library of classified foreign patents classified by subject matter. You could do a search and find out what the state of the art was. Today that library is nonexistent as a public facility. I assume because of unavailability of space and budgetary allocation. Examiners cannot search it either.

So that we in industry when we want to run a search of the foreign art have to go overseas. There are search agencies in Japan, the Hague in Holland and other places that perform these services on retainer.

So on the basis of fundamentals it seems to me that if we are to have an effective system, an adversary system, we must bring forward those that have knowledge of the prior art, that is, industry members, competitors. We must find some way to bring that knowledge to bear in the patent application proceedings.

But unless we do something to urge them and make them come forward during the application proceedings, I fear that many of them, if not most, will just sit back and say, "I would rather reserve my defenses until such time that I go to court." And they may never have to defend the patent, in which case they save a lot of trouble. Somebody else may have to defend it, and they may be saved a lot of trouble.

So it one has an option—and section 138(b) in S. 1321 would give him that option as I read it—he very well might not come forward, and spurious patents will continue to be issued.

We have to put teeth into the system. We cannot make patents easier to get and harder to bust at the same time. If we are going to make them harder to bust, we have to make them harder to get. If we make them harder to get, we are going to have to have some consequences for people who are in a position to take part in these proceedings and refrain from doing so.

There are many things that can be done in that regard, ranging all the way from incontestability—that many people would find too harsh, probably most—to personal estoppels to raise defenses in court proceedings that could have been brought before the Patent Office.

My purpose is not necessarily to come up with an ultimate prescription, but to say in principle that some consequence is needed some definite specific strengthening in the presumption of validity. Something that makes patents tangibly less susceptible to attack in the courts should result from these adversary proceedings for those that survive.

I also am mindful that historically in European countries that have opposition proceedings, there is oppressive use of oppositions to suppress competitive patents, keep them from issuing, delay issuance, perhaps encourage them to drop their applications because of economic considerations; so I believe that there should be effective sanctions against such abuses.

I think among the things that could be raised in this regard, one should be in a position of having to make a *prima facie* showing that he has a good basis or grounds for opposition before instituting that proceeding and putting the applicant through that burden. He perhaps should be made to bear the cost of that proceeding if he is unsuccessful, perhaps even to pay the applicant's costs or some part of them, at least in aggravated cases.

So there must be sanctions to discourage the possible oppressive use of the system.

Finally, I believe that if you are going to continue to encourage small companies and individual applicants to come forward, that you should consider giving them available help when their economic condition suggests that they need it. This could either be in the way of some sort of partial subsidization of legal expense on the one hand; or possibly, if you have an Office of Public Counsel, making public counsel services available to him in his defense of opposition proceedings.

I think, too, among other testimony that I have heard this morning I have heard most people favoring the completion of *ex parte* examination and the finding of *prima facie* patentability before publication, and before throwing open the application for opposition.

It has been said that this is fair play because the applicant should have the option of either holding it to himself, or at least he should know what is going to be granted before he decides to publish and give up his secrecy option.

I think there is a better reason for doing this: that is, early publication prior to a patentability determination will result in a proliferation of contested proceedings in opposition.

Senator HART. Proliferation of what?

Mr. PEDERSON. Contested proceedings in opposition. If the burden is to oppose before there has been *ex parte* examination, before there has been a *prima facie* determination of patentability, one would pass that opportunity at his peril, and in many cases it would be opposed and inter-party proceedings instituted that otherwise would not be instituted because it would have fallen by the wayside in the ordinary course of *ex parte* examination.

The question of deferred examination is up for discussion. I favor deferred examination but only if S. 1321 were changed to eliminate the provision for extension of term in correspondence to the deferral period. I do not believe an applicant should be entitled to a term extension by mere dilatory action. I think 12 years from the filing date is too short a term. I think 18 or 20 years from the filing date is more in line with international practice and is reasonable. I think if you have deferred examination it should remain 18 or 20 years from the filing date.

The deferral option is for the benefit of the applicant, among others. It gives him an opportunity to avoid incurring further expense until he has some basis for deciding that he has got something worth pushing. I see no reason why he should be entitled to have his term extended for exercising that option.

The case that never gets examined will never have to be opposed either, if we do lay these open to opposition only after an *ex parte* determination so that 50, 59, or 60 percent of the applications fall

by the wayside in the deferred examination process. They will never be published, and they will never have to be opposed. I am sorry—they may be published, but they would never have to be opposed, because no patent grant will be published.

On the matter of maintenance fees, I think that it would be a snare and a delusion to think we are going to help our situation with respect to eliminating spurious patents by the use of maintenance fees. I have not heard that this is a major purpose of those fees this morning. It has been mentioned by many of its proponents at other times. But it will only eliminate deadwood; it will not eliminate anything but deadwood.

The elimination of deadwood is really not a problem, because deadwood does not cause court cases. It has been suggested that perhaps maintenance fees might be an alternate to increasing filing or issue fees. I have to agree with Mr. Hogan. I think that once it has been determined that we really have a patentable invention here, something which benefits the public, promotes progress in science and the useful arts serves the constitutional purpose of the public benefit, that now to impose an annual maintenance fee in order to maintain that privilege, or that grant given by the Government pursuant to the constitutional objectives, is incongruous.

And I would also endorse Mr. Hogan's position, if you have to increase anything, increase the final fee, the issue fee, at which time the decision has to be made whether the monopoly is sufficiently attractive to justify that added expense.

I think the office of public counsel and the creation of an independent agency status of the Patent Office is laudable. The purposes that they should serve have been expounded upon today. I do not think they would suffice, of themselves, to convey enough credibility to patents to convert a 75 percent mortality rate to the 75 percent or better survival rate that I think ought to be injected into patent reform.

Incidentally, I think that the provisions that have not been mentioned—enhanced library facilities, mechanized search, things of this sort—are also laudable objectives in that regard, but insufficient of themselves to do the job.

I would be happy, if the committee has any comment or questions—

Senator HART. There are a number of proposals intended to improve the system reflected in S. 1321 and other bills before us. We asked for comment on five specifics in the series of hearings that we are conducting today.

Would you care to make a judgment with respect to those five specifics, which is the most important in achieving an improvement?

Mr. PEDERSON. Senator, I think an appropriate adversary system of some sort is the most important thing. It is the only way that we can bring industry members and competitors who are possessed of a knowledge of the state of the art that is needed on which to make a patentability judgment; they have to be brought into the picture.

Senator HART. That seems to be, as I have read memoranda of court cases—that seems to be the most frequent basis for the court's criticism of the system, the vacuum.

Mr. Brennan?

Mr. BRENNAN. No questions.

Senator HART. Mr. Nash?

Mr. NASH. One brief question.

We have heard, you know, assessments this morning that, yes, there is a crisis because a lot of patents are getting knocked out by the courts. The numbers have run about 70 percent in the court of appeals, as Senator Hart mentioned. That is just about 1 percent of the total number of patents that are issued.

You are a general patent counsel for a major corporation. I am sure, you report to your executives, they like to plan and make business judgments based on assumptions as to whether their patents are good or not good.

Could you give us the parameters or the context in which to evaluate the significance of either the 1 percent of the patents being litigated, or 70 percent of those patents that are litigated being knocked out as invalid.

Mr. PEDERSON. That is a very complex question. I would be happy to comment on it to the best of my ability. There is an implied premise in your question that I think perhaps ought to be attacked first.

That is, there seems to be a popular supposition that businessmen make business determinations based upon the consideration as to whether their patent is going to be allowed or not as a primary input. That is true in some cases, but that is far from universally true, at least in our industry. I cannot speak for all industries.

Here again, I must impose a qualification. At least within our industry, once an invention or development has been made and we have found it looks commercially attractive, we want to introduce it in our product. We are much happier if we can get strong patent coverage on it than if we cannot. But the fact that we cannot will not deter us from coming out with a new feature that we think is good. This is one point that I would like to clarify at the outset.

People in our industry do not set up research and development programs based entirely, or even primarily, on expectations of strong patent coverage. We do the best we can with what eventuates from the programs that look attractive on their own merit.

There is something drastically wrong with a system that says 75 percent of the patents that go to court are no good. I think industry is alarmed about this. I do not feel from my management, however, a direct sense of urgency that says to me, we are concerned that 75 percent of the patents are invalid.

They are not concerned. They do not extrapolate or extend these statistics to their holdings or to our holdings. They expect us to do better than that, and we have delivered on that expectation in the past, at least in those cases that have been tested. We run after-searches that are better than the Patent Office searches, because they encompass large areas of prior art that the examiner did not have available. We amend voluntarily to distinguish from prior art that the examiners did not bring forward.

We know we cannot rely upon the Patent Office process, not because of any lack of dedication on the part of the examining

corps, but simply because the system has these idiosyncrasies. As a result—I think if everyone took the pains we take, I think the statistics would be better, too.

Mr. NASH. As I understand it—and I would like the record to reflect it if it is correct—in terms of patent infringement suits, you have been successful in your patent litigations?

Mr. PEDERSON. We have been successful on both sides of patent litigation, asserting our own and defending against others. We have also been very quick to recognize good patents. Our policy is to recognize and respect good patents and to have no truck at all with bad patents.

We were Major Armstrong's first licensee, for example, on FM radio, paying millions of dollars in royalties, which many years later were ultimately forced upon some of our competitors by litigation brought by his estate after his death. But we signed up.

Mr. Parker has an inter-carrier sound patent in the television business. We signed up and paid royalties. When someone has a patent that we generally consider to measure up to the standards of patentability established by the law, we respect it. But if a patent is invalid, we will not have any part of it. We cannot afford it.

Mr. NASH. My last question is, would you be able to hazard a guess for us as to whether you would extrapolate out the percentage of invalid patents to those that are not litigated?

You must look at the official gazette as a patent lawyer and see what comes up. Do you think that we would have an invalidity rate of 70 percent if we, God forbid, litigated all patents?

Mr. PEDERSON. I do not think we can give any expectation regarding the number. A large percentage would be involved. I would agree with Mr. Hogan that a majority of these patents are not commercially significant patents, so their validity becomes moot in large measure.

I do not know any basis where you could extrapolate the figures, though, and say that as applied to the larger universe, the percentage would be the same.

Mr. NASH. Thank you.

Senator HART. Mr. Pederson, thank you very much.

Mr. PEDERSON. Thank you, sir.

Senator HART. We will adjourn until tomorrow morning at 9:30, rather than 10 o'clock, in this room.

[Whereupon, at 3:35 p.m., the subcommittee was recessed, to reconvene Wednesday, September 12, at 9:30 a.m.]

**S. 1321—FOR THE GENERAL REFORM OF THE PATENT
LAWS, TITLE 35 OF THE UNITED STATES CODE, AND
FOR OTHER PURPOSES**

WEDNESDAY, SEPTEMBER 12, 1973

U.S. SENATE,
SUBCOMMITTEE ON PATENTS, TRADEMARKS, AND COPYRIGHTS
OF THE COMMITTEE ON THE JUDICIARY,
Washington, D.C.

The committee met, pursuant to recess, at 9:30 a.m., in room 1114, Dirksen Senate Office Building, Senator Philip A. Hart presiding.

Present: Senator Hart (presiding).

Also present: Thomas C. Brennan, chief counsel and Dennis Unkovic, assistant counsel, Subcommittee on Patents, Trademarks, and Copyrights; Bernard Nash, assistant counsel, Antitrust and Monopoly Subcommittee.

Senator HART. The committee will be in order.

Mr. BRENNAN. Mr. Chairman, the first witnesses this morning appear on behalf of the Department of Commerce.

Mr. Bakke, would you identify yourself and your associates for the record please.

Mr. BAKKE. Good morning, Mr. Chairman.

My name is Karl Bakke. I am General Counsel of the Department of Commerce. Accompanying me this morning, on my right, is Rene Tegtmeyer, Acting Commissioner of Patents, and on his right, Michael Kirk, Director of the Patent Office's Office of Legislative and International Affairs.

Mr. BRENNAN. Do you have a prepared statement that you wish to have printed in full at this point in the record, Mr. Bakke?

Mr. BAKKE. That is correct, Mr. Brennan.

I would like merely to summarize the remarks contained in my prepared statement.

Mr. BRENNAN. Fine.

[The prepared statement of Karl E. Bakke follows:]

STATEMENT ON PATENT LAW REVISION BY KARL E. BAKKE, GENERAL
COUNSEL,

DEPARTMENT OF COMMERCE

I appreciate the opportunity to appear before this Subcommittee to explain the views of the Department of Commerce on the five patent topics which are the subjects of these hearings.

Our patent system began with the Constitutional recognition that substantial rewards and protection would encourage scientific research and the development of new inventions. These rewards and rights also provide the substantial financial investments needed to bring new inventions to the marketplace for the ultimate benefit of the consumer.

The patent system has played a uniquely important role in the development of American technology, and remains a major factor in our nation's economic vitality. Agriculture has prospered from inventions such as insecticides and food processing machinery. Modern electronic technology has brought us lasers, transistors and computers. Patented plastics, textiles and pharmaceuticals have created new markets and industries. The patent system has stimulated much of the necessary investment in research and development and the marketing of inventions which have brought, in turn, the development of entire industries and an unparalleled standard of living for the American public.

This Administration is keenly aware of the critical role of technology in promoting our national interests. President Nixon pointed out in his Special Message to the Congress on Science and Technology on March 16, 1972, that solutions to many of our pressing national needs depend on preserving the American pre-eminence in science and technology. The President declared:

"We know * * * that a strong and reliable patent system is important to technological progress and industrial strength. The process of applying technology to achieve our national goals calls for a tremendous investment of money, energy and talent by our private enterprise system. If we expect industry to support this investment, we must make the most effective possible use of the incentives which are provided by our patent system."

The Administration recognizes that the patent system has served our nation well since the first patent law was enacted in 1790 and continues to play an important role today. Nevertheless, we recognize that certain revisions in the system will enable it to better fulfill its crucial role in promoting the development and commercialization of technology. Our objectives are twofold: strengthening the patent system and enhancing public confidence in the system. We anticipate that the Administration's bill will be forwarded to this Subcommittee in the near future. Our bill will be comprehensive and will contain a complete revision of the present patent code. In addition, the Administration's position with respect to legislation dealing with the very important patent-antitrust relationship will be communicated to the Congress.

Our bill is intended to confront the formidable challenges faced today by the patent system. Let me mention the most important of these. The task of the Patent Office in determining which inventions are patentable becomes more and more difficult as technology becomes increasingly complex, and technical and scientific information proliferates. At the same time, it is increasingly important that new technology be disclosed to the public as early as possible. There is also a critical need to provide a high degree of predictability as to the validity of issued patents and thereby reduce time-consuming, costly and unnecessary legal actions in enforcing patent rights.

In discussing the formidable challenge faced today by the patent system, I do not mean to imply that the patent system is not basically sound. The present structure of our patent laws was established in 1836 and there have been many changes in our society since that time. However, our patent system has served and continues to serve the nation well, providing the needed stimulus to scientific and technical development so necessary to the continuance of our position of leadership in the world.

Therefore, the bill which the Administration will soon forward will contain a number of improvements designed to strengthen the overall functioning of our patent system. Many of the changes which will be contained in the Administration bill have been found in earlier proposals for patent reform, many of which have been sponsored by the Chairman of the Subcommittee, Senator McClellan. Included among these changes will be proposals for measuring the term of a patent from its filing date, permitting assignees to file patent applications, and strengthening the requirements for inventors and their assignees to bring forward information concerning their inventions. In addition, the bill developed by the Administration will contain several new proposals such as a statutory statement of the duties imposed on patent applicants and their attorneys to clarify and bring a measure of order to the rather murky question of fraud on the Patent Office, a statutory procedure which patent applicants may utilize to avoid the question of double patenting, and a statutory proposal outlining situations in which patentees and those with whom they deal may agree to arbitration of existing disputes respecting the validity, infringement, and misuse of their patents. The bill developed by the Administration will contain a number of other proposals which I will not mention at this time, designed to

further improve the basically sound patent system that we have today, and especially to strengthen the basis for the presumption of patent validity in response to the criticisms frequently leveled at the system.

I will turn now to the five topics with which this hearing is concerned.

MODIFICATION OF PATENT EXAMINATION PROCEEDINGS TO PROVIDE PUBLIC ADVERSARY HEARINGS

The consideration to be kept foremost in mind in any revision of the patent laws is that the procedures established must assure the issuance of valid patents. In designing any changes in our existing system, however, one must also be cognizant of the fact that the Patent Office presently conducts as full and as effective an examination proceeding as is possible on an *ex parte* basis. The effectiveness of this examination procedure is demonstrated by the fact that the Patent Office refuses to grant patents on more than 30 per cent of the applications which are filed. This fact can be better appreciated against the background of the prevailing practice in the United States with respect to the screening procedures to which applications are subjected prior to filing.

Unlike the practice in foreign countries, pre-examination searches are conducted with respect to the large majority of applications filed in the United States so that, at the time of filing, these applications, and especially the claims contained in them have been reasonably limited to the applicant's contribution which was not previously in the public domain. Accordingly, it speaks exceedingly well for our present examination procedure that more than 30 per cent of applications filed are refused completely and that almost all of the remainder are significantly limited in scope.

Nonetheless, comments are increasingly directed at the *ex parte* nature of examination proceedings under present law. While this procedure respects the right of individual applicants to maintain their contributions in secrecy until such time as they are given an indication of the scope of the patent protection they might receive, members of the public are not permitted to participate in the examination proceedings. In fact, the principal source of invalidity has been the inability of the Patent Office to learn of information and facts which are peculiarly in the possession of the public. Therefore, increased public participation in the patenting process would help to ensure that all the pertinent prior art, including that which could not be discovered by a Patent Office search of reasonable magnitude, is considered before a patent is granted. This would have the effect of strengthening the validity of patents, reducing the workload on courts in judging patent cases, and promoting public faith in the worth of the patent system.

We have reviewed various proposals relating to public adversary proceedings. Both S. 1321 and the bill which the Administration intends to introduce contain procedures which would permit the public to assist the Patent Office in ensuring that only valid patents are permitted to issue. However, we believe that certain features of the proposals in S. 1321 permitting public participation would unduly burden the examining process and might not achieve the desired ends of providing stronger and more reliable patents. In addition, S. 1321 would also subject patent applicants to the prospect of harassment.

Under S. 1321, all patent applications would be made available for public inspection promptly, subject only to the authority to keep them secret for a period of six months for purposes of national security review. Once examination of an application had commenced, any member of the public could participate or intervene in the examination proceeding and become a party of record in such proceeding. Following a decision by a primary examiner to grant a patent, any member of the public, whether or not previously a party to the examination proceeding, could request a reexamination, and the primary examiner would be required to render a second decision. Any party of record in any Patent Office proceeding, including a reexamination proceeding, could apply at any time to a primary examiner or other presiding official for subpoenas or other orders to take discovery, testimony or evidence.

In our view, the provisions of S. 1321 providing for adversary proceedings in the Patent Office present several significant problems. First, it should be noted that issues with respect to the patentability of applications are generally not fully developed until an examiner has completed his examination. Until this

stage of the Patent Office proceeding, potential opposers would have no firm basis for determining their interest in narrowing or defeating the claims in an application. Considering the time and money it would take an opposer to investigate whether the claims of a published application impinge on his commercial activities, and the time and expense to determine whether any grounds existed for opposing the application, it is unlikely that many members of the public would elect to oppose an application until the Patent Office had completed its investigation.

While there would be little benefit in opening patent applications to the public before the Patent Office investigation was completed, such a procedure would impinge upon the legitimate interests of inventors in being given some indication of the likelihood of receiving patent protection before having their inventions disclosed to the public. The fundamental notion of our patent system involves a contract theory under which an inventor is induced to disclose his invention in return for an exclusive right to practice that invention. If this principle were modified to require inventors to publicly disclose their inventions before the Patent Office made any investigation, some inventors might be deterred from filing patent applications, and elect to protect their inventions as trade secrets.

The very broad provisions of S. 1321 relating to reexamination present a possibility for harassment of patent applicants by their competitors. The opportunity both to participate in the examination procedure and to obtain reexamination thereafter, and the opportunity to obtain broad discovery, could invite competitors of the patent applicant to abuse opposition proceedings. We believe that the objectives of section 135 of S. 1321 can be achieved with the somewhat more limited provision of the bill that will be recommended by the Administration.

Finally, the adversary procedure contained in S. 1321 would result in a significant addition of essentially worthless and duplicative literature to the Patent Office search file, thus increasing the time it would take for patent examiners and the public to review the files. Since all applications would be made public under S. 1321 within six months of filing, the disclosures of these applications would be added to the examiner's search file. However, over 30 per cent (34 per cent in 1972) of all patent applications filed do not result in patents, usually because the inventions disclosed and claimed are not new, or only represent obvious modifications of work done by others. Examiners would be forced to sift through this duplicative material in conducting their searches. Since between 25 per cent and 50 per cent of an examiner's time is given to searching the files of prior patents and publications, the increase in search time that would result from adding published, unpatentable patent applications to the files would be most dysfunctional.

The Administration bill is directed toward the same goal as S. 1321, but seeks to strike a balance between the interest of the inventor in not disclosing his invention until he is given some indication of the scope of coverage he might receive, and the interest of the public in the issuance of strong and reliable patents. The proposal that will be made by the Administration would retain the essence of existing law by providing that applications would initially be examined in secrecy. When an examiner determined that the claims in an application were allowable, the application would be published prior to the actual granting of a patent, to permit the public to assist the Patent Office through an opposition procedure.

Following publication, members of the public would have one of two routes available to them. First, within three months after publication of the application, a member of the public could cite patents, publications or other documentary evidence relating to the application, together with a written explanation of their pertinency to the patentability of the application. Based on this submission, the Commissioner would direct further examination of the application.

Under the second route, members of the public would be permitted to participate in an opposition proceeding before the Board of Examiners-in-Chief. Under this option, both the applicant and the opposing member of the public would be entitled to submit written briefs, present oral argument, take depositions, discovery or testimony, and present oral testimony and cross-examine witnesses in the proceeding before the Board. However, in proceedings in which the issuance of a patent was only on the basis of prior patents, publications or other documentary evidence, parties would be permitted to take depo-

sitions, discovery or testimony and present oral testimony and cross-examine witnesses only upon a showing of good cause.

Applicants whose applications are subjected to this opposition procedure would have interim rights available for the unauthorized use of their inventions prior to the time a patent issued.

We believe the Administration bill would provide a more efficient and orderly process than S. 1321 by requiring that only those applications be published which have been found allowable by the Patent Office examiner. Since the 30 per cent of applications not allowed by the examiner would not have to be considered for opposition, the time and expense both for interested members of the public and for the Patent Office would be reduced. With a clear definition of the subject matter before them, interested members of the public could readily determine whether the subject matter was such as to justify the expenditure of time and effort to find additional prior art not cited by the Patent Office examiner.

Since patent applicants would not be required to disclose their inventions to the public until after they received an indication from the Patent Office that their applications contained patentable subject matter, they would not be encouraged to opt for trade secret protection to avoid the risk of disclosing their inventions without obtaining a patent.

In addition, while opposers would be given adequate procedures to fully contest patentability of an application during an opposition proceeding, the Administration proposal includes limitations which are believed to reduce the possibility of harassment. These limitations include the good cause requirement for obtaining discovery and the like when the opposition is based only on documentary evidence relating to the state of the art, and the fact that the public cannot participate during the initial examination before the Patent Office examiner. The Administration proposal would also avoid increasing the size of the search files through publication of the 30,000 applications per year that are denied by the Patent Office.

Accordingly, it is believed that the Administration bill will achieve the goal of S. 1321 of strengthening the basis for the presumption of validity of issued patents by affording the public an opportunity to participate in an adversary proceeding, but will avoid the accompanying undesirable side effects of section 135 of S. 1321.

CREATION OF THE OFFICE OF PUBLIC COUNSEL

A strong public interest exists, of course, in the issuance of patents on inventions which satisfy the statutory criteria. Problems are wrought upon society both by the issuance of invalid patents and by the refusal to issue patents on deserving inventions which in fact satisfy the statutory criteria.

S. 1321 recognizes the public interest in the examination and issuance of patents with the creation in section 3(d) of an Assistant Commissioner for Appeals, Litigation and Public Counsel, referred to in the bill as the Public Counsel. The Public Counsel would carry out a number of functions, many of which do not exist under present law. He would be charged with the duty of assuring as an advocate through the adversary process, that high quality patents are issued by the Patent Office. To accomplish this goal, he would be empowered to intervene and participate at any time in any Patent Office proceeding or any appeal from a Patent Office proceeding when, in his judgment, it was in the public interest. In addition, the Public Counsel would be charged with defending appeals from a primary examiner before the Board of Examiners-in-Chief and appeals from the Board before the Court. Under S. 1321 the Public Counsel is also given broad power to issue subpoenas or orders in connection with matters under investigation by him.

While sympathizing with the objectives underlying the proposal for a Public Counsel, the Department of Commerce questions the effectiveness of a Public Counsel as proposed in S. 1321. As a practical matter, the Public Counsel could not intervene and participate in any significant number of the 115,000 patent applications examined by the Patent Office each year nor could he oppose a very substantial number of the 75,000 patents issued annually. He would have no rational basis on which to select those cases in which intervention or opposition would be most desirable. The value of a patent is determined by the marketplace and is generally difficult to judge from reading the application. The importance of an individual case does not depend upon the resources of

the patent applicant or the field of subject matter involved. Therefore, the Public Counsel's decision on the cases in which he would participate would likely be no more than a random selection.

Members of the public in a particular industry who are able to determine that a particular invention is significant and wish to oppose it would be permitted to do so under both the Administration bill and S. 1321. If the opposer has a real interest in the subject matter, it is likely that he would want to present his case directly, and not through a Public Counsel. Accordingly, the Department of Commerce questions the value of the Public Counsel in this facet of his role as ombudsman.

We believe, however, that certain of the functions proposed for the Public Counsel would be practical and would strengthen the tools of the examiner and improve the examination procedure. Accordingly, the Administration bill will contain provisions to ensure the performance of these functions.

Under section 3 of the Administration bill, the Commissioner of Patents would be required to designate an officer of the Patent Office to perform certain limited functions to aid examiners and reinforce the ex parte examination proceeding. The bill would empower a primary examiner to request assistance from the officer with respect to the examination of a particular application when the examiner believed it desirable to transform the proceeding into an adversary one. The officer would intervene and participate in the examination proceeding if he considered it in the public interest to do so. The officer would have the right to seek discovery of an applicant and would have other rights and powers of a party in Patent Office proceedings. While it is expected that such intervention would occur only in a few situations, it is believed that this additional resource afforded the examiner would strengthen the examination process.

In addition, the Administration bill would provide that all appeals from decisions of examiners to the Board of Examiners-in-Chief would be defended by the officer established under section 3 of the bill rather than by the examiner. This would improve the adversary proceeding before the Board by having the examiner's position presented by another person.

Finally, the Administration bill would codify the existing authority of the Patent Office to investigate the conduct of patent applicants, attorneys and those engaging in unauthorized practice before the Office. The existing authority to investigate such matters would be strengthened by providing the officer established by section 3 of the bill with subpoena power with regard to such investigations. While fraud on the Patent Office or improper conduct on the part of an attorney or agent registered to practice before the Office is, insofar as we know, a rare occurrence, the added authority in the Administration bill should go far to dispel any questions of improper behavior in such situations.

ESTABLISHMENT OF A SYSTEM FOR DEFERRED EXAMINATION OF PATENT APPLICATIONS

Deferred examination of patent applications has been suggested periodically at least since the early 1960's as a means for overcoming the backlogs faced by patent offices around the world. The Netherlands, in 1964, became the first country to adopt a deferred examination system. Since that time, deferred examination was adopted in West Germany, Japan, Hungary and Australia.

The rationale for deferred examination is that since not all applications for patents are of the same value, it is not good economic practice for a patent office to devote substantial efforts to applications having little value when it could rely upon the selection of the more important applications by an applicant and his competitors who are in the best position to make such selections. Such a system reduces the number of applications requiring examination because some applicants who chose to defer the examination of their applications later conclude that their inventions do not warrant examination and permit them to become abandoned. On the assumption that the deferred applications which are later abandoned involve inventions of lesser value, a deferred examination system permits a patent office to concentrate its resources on the more valuable inventions. Of course, if the examination of an application is merely deferred, no savings are realized.

S. 1321 provides for a deferred examination system. Under this system, examination of an application will be deferred unless the applicant requests

examination. At any time before the expiration of five years from the earliest effective filing date of the application, anyone could request examination. Members of the public would be required to pay the basic examination fee and the applicant would be required to pay all other fees associated with the application.

When examination of a deferred application is requested, the Commissioner would be empowered under S. 1321 to require the applicant to request examination of any of his other deferred applications which relate to the deferred application. If no examination is requested or the applicant fails to request an examination called for by the Commissioner of any of his related deferred applications, such applications become abandoned. There would be a tolling of the term of a deferred application for the period during which the examination of such application was deferred.

The bill which the Administration will submit contains no provision for deferred examination. We believe that a deferred examination system would not be appropriate for the United States since the disadvantages associated with such systems clearly outweigh their asserted benefits.

Serious consideration of a deferred examination system for the United States began with the Report of the President's Commission on the Patent System in 1966. The Commission recommended giving the Commissioner discretionary authority to institute deferred examination. This recommendation was founded in part upon an estimate by the Patent Office in 1964 that the then existing backlog of 220,000 applications and pendency period of four years would gradually increase until, by 1975, there would be a backlog of 535,000 patent applications with a pendency period of 10 years. Of course, this projection has not come to pass. At the present time, there is a backlog in the Patent Office of less than 200,000 applications and a pendency period of 23 months.

Accordingly, the principal reason for the adoption of deferred examination in the Netherlands, West Germany and Japan—that of a steadily increasing and unmanageable backlog of applications—does not exist in the United States. For this reason, adoption of a deferred examination system in the United States cannot be based on increasing backlog.

Another, more speculative, benefit has been suggested by some proponents of deferred examination systems. Their rationale is that, with deferred examination, patent office examiners would be required to examine fewer applications and would thereby be able to spend more time on the applications they did examine, resulting in an increase in the strength and reliability of issuing patents. These proponents point to the experience of the Netherlands Patent Office in which only 40 to 45 percent of the applications filed are subjected to full examination. Upon closer analysis, however, it is not believed that the adoption of a deferred examination system can be based on this rationale either.

Initially, it should be noted that the Dutch and other foreign systems for deferred examination differ from the deferred examination proposal contained in S. 1321. Under the Dutch system, the examination process is broken into two stages—search and examination. The Dutch experience has been that a search is requested for approximately 65 percent of all patent applications filed and that subsequent examination is requested for only 40 to 45 percent of the applications filed. Accordingly, the Dutch deferred examination system saves searching time for examiners in only 35 percent of the applications filed. If the Dutch experience could be translated to the United States, it would still mean that possibly 65 percent of the applications filed would be examined since S. 1321 does not separate the search and examination functions.

It is not believed, however, that the Dutch experience can be translated to the United States. In the Netherlands, approximately 85 percent of the patent applications filed are of foreign origin, compared with approximately 30 percent for the United States. This substantially different mix of home and foreign origin applications is significant. For most applicants, their home market is the most important and they are more likely to seek the issuance of a patent in their home country before they seek a patent in a foreign country. Statistics from Japan, where the percentage of home origin applications is more like that of the United States, tend to confirm this. During 1971, the first year of operation of the deferred system in Japan, the rate of requests for examination was more than 50 percent greater for applications filed by Japanese nationals than for applications filed by foreigners.

This is not surprising, however, since filing in foreign countries presents a different picture than filing in a home country. The Paris Convention for the Protection of Industrial Property contains a provision entitling a patent applicant to obtain the benefit of the filing date of his first filed application for all subsequent applications filed within one year. Once an application is on file in a foreign country having a deferred examination system, the applicant can then do nothing for a period of from five to seven years while awaiting a decision as to the scope of protection he will receive in his home country. The applicant can also use this period to determine, based on the protection he is given in his home country and the market conditions in the foreign country, whether it is economically feasible for him to utilize the patent in that particular market. Thus, after an applicant has secured a filing date in a foreign country to preserve his option to later obtain a patent, he has many reasons to defer examination.

In view of the foregoing considerations, it is believed that no correlation or estimate of what the United States experience would be with a deferred examination system can be based on the Dutch experience.

Notwithstanding the questionable benefits which the United States would realize with a deferred examination system, there have been recent indications both in Great Britain and in connection with the drafting of the European Patent Convention that the disadvantages of deferred examination systems outweigh their alleged benefits. The principal disadvantage which has been recognized by those countries having experience with deferred examination systems is that such systems transfer to members of the public the obligation to examine all deferred applications which might possibly issue later and have impact upon their manufacturing or retailing activities.

The effect of this transfer is the creation of uncertainty among the competitors of a patent applicant over whether the subject matter disclosed in a deferred patent application will ultimately be patented. Without knowing whether a patent will be granted, competitors cannot afford to risk investment in entering a market. This uncertainty has a paralyzing effect on industry with respect to efforts to produce new products potentially covered by published and deferred patent applications.

It is not an answer that competitors of a patent applicant may request examination of the deferred application themselves by paying a fee to the Patent Office. The expense of requesting examination in a large number of applications in a given technical field can be prohibitive. Moreover, it is difficult for a competitor to ascertain when he should request examination of a deferred application, since the claims contained in an application when filed could be broadened or changed in scope during subsequent examination so that patent protection might be granted on a broader basis or with a different scope than a competitor might anticipate. Therefore, to protect his interests, a competitor must scrutinize the entire disclosure of an application, and not just the claimed subject matter. If broadening or changes in the scope of claims is not permitted, the claims in the application as initially submitted will be so broad as to prevent a good analysis by third parties.

In addition, deferred examination systems also have other adverse consequences. In one respect, such systems are largely self-defeating. Since deferred applications, including those which later become abandoned, would be published, at least 30,000 search documents of dubious value would be added to the examiners' search files each year, thereby increasing the time it would take for examiners to perform their searches. Thus, the limited savings in examiners' time which might be realized from a deferred examination system by virtue of having to search fewer applications would be largely offset by the fact that the examiners would have to search additional, duplicative material on the applications that were examined.

It should also be noted that deferred examination systems are not without adverse cost implications, especially if one assumes that the examining manpower will not be reduced, but merely spread over fewer applications. This could have serious cost consequences for patent applicants and patentees. In fact, the greater the number of applications abandoned under a deferred examination system, the greater the fees that would have to be charged for those applications which were examined.

In summary, the Administration has not included a deferred examination system in its proposal because it is convinced that the reduction in the number

of cases to be examined would be fairly small and that the real and potential disadvantages flowing from a deferred examination system would far outweigh any benefits of such reduction.

REVISION OF THE PATENT FEE SCHEDULE, INCLUDING THE ESTABLISHMENT OF MAINTENANCE FEES

The Constitutional purpose of the patent system is the promotion of the economic welfare of the nation through advances in science and technology by providing the incentive of limited exclusivity to inventions in return for their disclosure. Thus, the promotion of science and technology for the benefit of the public lies at the very heart of the patent system. It is also true, however, that the patent system provides rewards for individual inventors and entrepreneurs, although these rewards are in return for the disclosure of inventions.

Recognizing that the benefits of the patent system flow both to the public and to individual inventors, it has long been the policy of this country to ask each to support a share of the cost of operating the patent system. When Congress last adjusted patent and trademark fees in 1965, it was contemplated that the Patent Office should recover through fees from $\frac{2}{3}$ to $\frac{3}{4}$ of its operating budget. More recently, in the Subcommittee Print of S. 643, introduced by Senator McClellan in the last Congress, a provision was included which would have given the Commissioner authority to set the fees to be paid in connection with the filing and examination of patents and trademark applications so as to effect an overall recovery for the Patent Office in the range of 65 to 75 per cent of its costs of operation.

Both the bill the Administration plans to introduce and S. 1321 follow the general approach of S. 643 Committee Print by giving the Commissioner authority to set fees to recover in the range of 65 to 75 per cent of the costs of operating the Patent Office.

S. 1321, however, would also establish a maintenance fee system which presumably would begin the fourth year following patent issuance with a fee no less than \$1,000 and would require annual fees thereafter increasing by at least 25 per cent each year. Certain exemptions would be provided for the payment of filing, examination and maintenance fees for individual inventors and small businessmen. In addition, the Commissioner and the Board of Appeals could defer payment of accrued maintenance fees for certain periods where the patentee could establish that he was unable to work his invention or to pay the maintenance fee.

In our view, there are serious problems associated with the maintenance fee proposal contained in S. 1321, the most significant of which is that a patentee could be required to pay in excess of \$15,000 to maintain his patent in force for the 12 year term set by S. 1321. I might note that this amount would be even greater under the 20 year term which has been contained in most of the other recent patent revision bills and which will be proposed in the bill the Administration will submit. It is believed that maintenance fees of this magnitude would seriously impair the proper functioning of the patent system. In fact, the fees established by S. 1321 are so great that the revenue which would be generated from maintenance fees alone, paid over the 12 year life of only 4,500 of the 75,000 patents issued annually, would be sufficient to operate the Patent Office for an entire year. The maintenance fees under S. 1321 are so high that the Patent Office would undoubtedly recover far in excess of the 65 to 75 per cent range set forth in the bill.

The patent system should encourage inventors to commercialize their inventions. With fees of the magnitude that would be required by S. 1321, only those patents covering inventions which could be commercialized early and to a great extent could reasonably be expected to remain in force beyond four years from the date of patent issue.

While we recognize that provisions are included in S. 1321 to ameliorate the stifling effect of these high maintenance fees by permitting certain exemptions and deferrals, it is believed that these exculpatory provisions would not function satisfactorily in practice and would not provide the needed relief from the maintenance fees. Initially, there is the question of determining how exemptions could be designed so as to encourage individual inventors and small businessmen. There is also the additional question of defining these categories of applicants.

Moreover, the requirement on an individual to establish, by a preponderance of proof, that he has satisfied the criteria which would entitle him to defer payment of the maintenance fee could prove as expensive and as unworkable as the payment of the maintenance fee itself. Also, the provision would place a continuing obligation on patentees seeking deferral of maintenance fees to rejustify the deferral each year, thus placing an unnecessary and unwarranted burden on both the patentee and the Patent Office.

In addition, the possibility of deferring payment of maintenance fees under S. 1321 is limited to ten years. This limitation could prove to be particularly harmful to the owners of inventions whose time has not yet come, especially if the more reasonable term of 20 years is adopted. Many of the great inventions we now enjoy took many years to commercialize and did not enter our lives and industries until long after their patenting.

A study of inventions by the Batelle Columbus Laboratories under a grant by the National Science Foundation revealed that it took an average period from first conception to market realization of 19.2 years. Moreover, the study found no evidence that the time from conception to commercial realization was becoming any shorter. Considering the time it took to commercialize some very significant inventions covered by this study—heart pacemaker—32 years; xerography—22 years; magnetic core computer memories—22 years—it becomes quite clear that the maintenance fee system of S. 1321 would work to the detriment of the public by depriving it of the commercialization of some very significant inventions.

Even maintenance fees set at a more reasonable level for the purpose of reducing filing and issue fees have been rejected by the majority of the users of the patent system. Maintenance fees were proposed by the Department of Commerce in the early 1960's as a means for permitting the Patent Office to raise its fee recovery rate to a range of 65 to 75 per cent of the cost of operating the Patent Office. At the time of the hearings on this proposal in 1964, the increase in fees under discussion was approximately 300 per cent of the existing fees. Notwithstanding this dramatic increase in fees, the proposals for maintenance fees were rejected in favor of obtaining the entire increase through higher filing and issue fees.

In addition, it should be noted that while maintenance fees can be used to increase revenue for the government, they do not do so without adding significant costs to administer the collection of fees. Under most maintenance fee systems, patentees are sent reminders when maintenance fees are due. Depending upon what the applicant does, the Patent Office would either have to process the payment of his maintenance fee into the general treasury and appropriately indicate such fact in the file of the patent, or provide a public notice that the maintenance fee has not been paid and record this fact in the file of the patent and on every copy of the printed patent thereafter distributed.

While cost to the Patent Office of administering the maintenance fee system of S. 1321 cannot be predicted with any accuracy, it is certain that the cost of administering such a system would exceed one million dollars annually, and the patentees themselves would incur expenses of at least an equal amount.

There is some desirability, however, in encouraging patent owners to surrender to the public patents which they are not using and are not making good faith and diligent efforts to commercialize. The bill the Administration will introduce contains such an incentive. Under the Administration bill, patentees would be required, in situations where there was no use of a patent and no evidence of any diligent and good faith effort to commercialize it, to pay reasonable fees if they wished the patent to remain in force. Specifically, at the tenth and fifteenth anniversaries from the filing date of a patent, a patentee would be required to file a verified statement with the Patent Office indicating whether he or his licensee was making, using or selling the patented invention or whether he was diligently and in good faith trying to commercialize the patented invention. If the patentee could not make such a statement, he would pay a fee of \$1,000 on the tenth anniversary and \$2,500 on the fifteenth anniversary to maintain his patent in force. The maintenance fees could be increased by the Commissioner under the same authority he would have to increase other fees.

Under the Administration bill, inventors of limited means, having difficulty commercializing their patented inventions, would never need worry about paying a fee to maintain their patents in force as long as they were engaged

in diligent and good faith efforts to commercialize their inventions. Accordingly, it is unnecessary under the approach which the Administration will take in its bill to provide exemptions for independent inventions and small businessmen.

In addition, where patentees are successful in commercializing their inventions, no maintenance fees would need be paid. Finally, since the statements called for under the Administration bill would only be due twice during the term of a patent, the administrative problems of the Administration's proposal will be significantly less than those of S. 1321.

ADMINISTRATIVE RESTRUCTURING OF THE PATENT OFFICE, INCLUDING THE PROPOSED ESTABLISHMENT OF THE PATENT OFFICE AS AN INDEPENDENT AGENCY

There have been recurring suggestions that the Patent Office be made an independent agency within the Executive Branch, rather than a bureau within a cabinet-level Department. Notwithstanding these suggestions and the inclusion of such a proposal in S. 1321, it is believed that the Patent Office should remain a component of the Department of Commerce. Accordingly, the Administration will continue the present arrangement in its bill.

One of the more important administrative developments in recent years has been the trend toward organization of the myriad Federal agencies on a functional basis. Due in great part, perhaps, to increasingly sophisticated analytic procedures of the Office of Management and Budget and the advent of program budgeting in the early 1960's, there is a growing realization that the activities of the Federal Government which contribute to a particular goal should be grouped together to achieve that goal. This sharply contrasts with the past unpatterned growth and placement of various bureaus in the major departments of the Executive Branch.

The importance of such organization by function was central to President Nixon's Executive Reorganization Plan proposed to the 92nd Congress. As stated by the President:

"Instead of grouping activities by narrow subjects or by limited constituency, we should organize them around the great purposes of Government in modern society. . . . Then the success of Government will at least be clearly linked to the things that happen in society rather than the things that happen in Government."

One vital mission of the Department of Commerce is the promotion of science and technology. In view of today's pressing needs for increasing our productivity and exports through technological innovation, the contributions of the agencies grouped under the Assistant Secretary of Commerce for Science and Technology are all the more important to the accomplishment of this mission of the Department of Commerce.

The patent system—of which the Patent Office is the heart—has the Constitutional mandate "to promote the progress of . . . the useful arts." In modern terminology, its role is to promote technological and industrial progress by providing effective incentives to invention and innovation and by bridging the technological and business communities.

The Patent Office also performs a function of great and direct commercial significance in the examination and registration of trademarks, which often are among the more valuable and important assets of a business.

These two principal activities of the Patent Office are, therefore, most compatible with, and represent an essential part of, the total spectrum of integrally related means by which the Department of Commerce carries out its mission of promoting the nation's economic and industrial strength.

As part of the Commerce organization the Patent Office enjoys enhanced operational efficiency. It relies heavily upon the services and resources which are centralized in the Department of Commerce. If the Patent Office were an independent agency, it would need to duplicate all or most of these services and resources—less efficiently and more expensively in terms of both staff and costs. For example, it would become necessary for the Patent Office to develop its own general legal and procurement expertise, obtain printing equipment and expertise, acquire knowledge of property management and acquisition, and establish many other functions.

In brief, to function as an independent agency the Patent Office would have to acquire substantial additional resources of specific skills and equipment.

Another benefit of the present arrangement from the standpoint of efficiency is the independent performance evaluation which the Patent Office receives as a component bureau within the Department of Commerce. Under this arrangement, Patent Office activities are constantly evaluated both by higher echelons in the Department and by analysts of the Office of Management and Budget. Thus, the Patent Office is continually called upon to evaluate and define its goals, to offer coherent plans for achieving them, and to account for any failure to achieve these goals.

It is believed that the total effectiveness of the Patent Office is conducting its operations and representing the interests of the scientific, technical, and industrial communities, as well as the general public, is best served with the Office as part of the Department of Commerce.

By being in the mainstream of the Executive Branch, the Patent Office is also better able to represent the concerns and interests of patent owners, and to more effectively make available to the President the benefit of the complete views of the interested sectors. For example, three years ago the Patent Office was able to bring to the attention of the President its potential for contributing to his environmental quality policy. This permitted the President to direct the taking of the affirmative steps which the Patent Office had identified.

Perhaps a fundamental assumption underlying proposals that the Patent Office be an independent agency within the Executive Branch is that, as part of a larger organization, the Office is subject to undue influence and pressures from its parent agency. It is reasoned that if the Patent Office were a separate agency, this influence from above would be eliminated.

However, we are aware of no evidence in the history of the Patent Office which would suggest that any improper influence was exerted upon the Patent Office by officials in the Departments to which the Office has been attached. To the contrary, the Patent Office has enjoyed freedom and latitude in its operations.

In view of the many sound reasons for the Patent Office continuing to be an agency within the Department of Commerce, and the complete absence of any reasons or evidence suggesting that it be removed, the bill which the Administration will submit will continue the present relationship.

Thank you for the opportunity to present the views of the Department of Commerce.

STATEMENT OF KARL E. BAKKE, GENERAL COUNSEL, DEPARTMENT OF COMMERCE, ACCOMPANIED BY: RENE TEGTMAYER, ACTING COMMISSIONER OF PATENTS, AND MICHAEL KIRK, DIRECTOR OF THE OFFICE OF LEGISLATIVE AND INTERNATIONAL AFFAIRS (PATENT OFFICE)

Mr. BAKKE. Mr. Chairman, I appreciate the opportunity to appear before this subcommittee to explain the views of the Department of Commerce on the five patent topics that are the subjects of this hearing.

The patent system has played a uniquely important role in the development of American technology and remains a major factor in our Nation's economic vitality. The patent system has stimulated much of the necessary investment in research and development and the marketing of inventions that have brought, in turn, the development of entire industries and an unparalleled standard of living for the American public.

This administration is keenly aware of the critical role of technology in promoting our national interests. President Nixon pointed out in his special message to the Congress on Science and Technology on March 16, 1972, that solutions to many of our pressing national needs depend on preserving the American preeminence in science and technology.

The administration recognizes that the patent system has served our nation well since the first patent law was enacted in 1790 and continues to play an important role today. Nevertheless, we recognize that certain revisions in our system will enable it better to fulfill its crucial role in promoting the development and commercialization of technology. Our objectives are twofold: strengthening the patent system and enhancing public confidence in that system.

We anticipate that the administration's bill will be forwarded to the Congress in the near future. Our bill will be comprehensive and will contain a complete revision of the present patent code. In addition, the administration's position with respect to legislation dealing with the very important antitrust relationship will be communicated to the Congress.

Our bill is intended to confront the formidable challenges faced today by the patent system. In discussing the challenges faced today by that patent system, I do not mean to imply that the system itself is not basically sound. Our patent system has served and continues to serve the Nation well.

Therefore, the bill that the administration will soon forward will contain a number of improvements designed to strengthen the overall functioning of our patent system. Many of the changes that will be contained in the administration bill have been found in earlier proposals for patent reform, many of which have been sponsored by the chairman of this subcommittee, Senator McClellan.

In addition, the bill developed by the administration will contain a number of new proposals designed further to improve the basic sound patent system that we have today, and especially to strengthen the basis for the presumption of patent validity in response to the criticisms frequently leveled at the system.

I will turn now to the five topics with which this hearing is concerned.

ADVERSARY PROCEEDINGS

The first of these is modification of patent examination proceedings to provide public adversary hearings. The consideration to be kept foremost in mind in any revision of the patent laws is that the procedures established must assure the issuance of valid patents. In designing any changes in our existing system, however, one must also be cognizant of the fact that the Patent Office presently conducts as full and as effective an examination proceeding as possible on an *ex parte* basis.

Nonetheless, comments are increasingly directed at the *ex parte* nature of examination proceedings under present law. The principal source of invalidity has been the inability of the Patent Office to learn of information and facts that are peculiarly in the possession of the public. Therefore, increased public participation in the patenting process would help to insure that all the pertinent prior art, including material that could not be discovered by a Patent Office search of a reasonable magnitude, is considered before a patent is granted. This would have the effect of strengthening the validity of patents, reducing the workload on courts in judging patent cases, and promoting public faith in the worth of the patent system.

Both S. 1321 and the bill that the administration intends to introduce contain procedures which would permit the public to assist the Patent Office in ensuring that only valid patents are permitted to be issued. In our view, however, the provisions of S. 1321 providing for adversary proceedings in the Patent Office present several significant problems.

First, it should be noted that issues with respect to patentability are generally not fully developed until an examiner has completed his examination of an application. Until this stage of the Patent Office proceeding, potential opposers would have no firm basis for determining their interest in narrowing or defeating the claims in an application. Considering the time and money it would take an opposer to investigate whether the claims of a published application impinge on his commercial activities, and the time and expense to determine whether any grounds exist for opposing the application, it is unlikely that many members of the public would elect to oppose an application until the Patent Office had completed its investigation in any event.

Thus, there would be little benefit in opening patent applications to the public before the Patent Office investigation was completed, and such a procedure would impinge upon the legitimate business interests of inventors and those interests which they have in receiving some indication of the likely scope of patent protection before having their inventions disclosed to the public. The fundamental notion of our patent system involves a contract theory, under which an inventor is induced to disclose his invention in return for an exclusive right to practice that invention. If this principle were modified to require inventors publicly to disclose their inventions before the Patent Office made any investigation, some inventors might be deterred from filing patent applications and elect to protect their inventions as trade secrets.

Also, the very broad provisions of S. 1321 relating to reexamination present a possibility for harrassment of patent applicants by their competitors. The opportunity both to participate in the examination procedure and to obtain reexamination thereafter, and the opportunity to obtain broad discovery, could invite competitors of the patent applicant to abuse the opposition proceedings.

Finally, the adversary proceeding proposal in S. 1321 would require the addition of a significant amount of essentially worthless and duplicative literature to the Patent Office search file. Since all applications would be made public under S. 1321, the disclosures of these applications would necessarily be added to the examiner's search files. However, over 30 percent of all patent applications filed do not result in patents. Since between 25 and 50 percent of an examiner's time is given to searching the files of prior patents and publications, the increase in search time that would result from adding published, unpatentable patent applications to the files would be counterproductive.

The administration bill seeks to strike a balance between the interest of the inventor in not disclosing his invention until he is given some indication of the scope of coverage he might receive, and the interest, on the other hand, of the public in the issuance of strong

and reliable patents. The administration proposal will provide for applications initially to be examined in secrecy. When an examiner determines that the claims in an application are allowable the application would then be published prior to the actual granting of the patent, to permit the public to assist the Patent Office through an opposition procedure.

Following publication, members of the public could follow either of two routes. First, a member of the public could cite patents, publications, or other documentary evidence relating to the application, together with a written explanation of its pertinency to the patentability of the application. Based upon this submission, the Commissioner would direct further examination of the application.

Under the second route, both the applicant and the opposing member of the public would be entitled to submit written briefs, present oral argument, take depositions, discovery or testimony, and present oral testimony and cross examine witnesses in a proceeding before the Board of Examiners-in-Chief. However, in proceedings in which the issuance of a patent was questioned only on the basis of prior patents, publications or other documentary evidence, parties would be permitted to take depositions, discovery or testimony and present oral testimony and examine witnesses only upon a showing of good cause.

Applicants whose applications are subjected to this opposition procedure would have interim rights available for the unauthorized use of their inventions prior to the time a patent was issued.

We believe that the administration bill would provide a more efficient and orderly process than S. 1321, by requiring publication only of those applications which have been found allowable. Since the 30 percent of applications not allowed by the examiner would not have to be considered for opposition, the time and expense both for interested members of the public and for the Patent Office would be reduced.

With a clear definition of the subject matter before them, interested members of the public could more readily determine whether they could justify the expenditure of time and effort to oppose.

Since patent applicants would not be required to disclose their inventions to the public until they received an indication from the Patent Office that their applications contained patentable subject matter, they would not be encouraged to opt for trade secret protection to avoid the risk of disclosing their inventions without obtaining a patent.

The administration proposal would also avoid increasing the size of search files through publication of the 30,000 applications per year that are denied by the Patent Office.

Accordingly, it is believed that the adversary proceedings provided in the administration bill will strengthen the basis for the presumption of validity of issued patents, but will avoid the accompanying undesirable side effects of the proposals in S. 1321 on this subject.

PUBLIC COUNSEL

The second issue is the matter of creation of the Office of Public Counsel. S. 1321 recognizes the public interest in the examination

and issuance of patents with the creation, in section 3(d), of a public counsel to assure, as an advocate, that high quality patents are issued by the Patent Office.

While sympathizing with the objectives underlying the proposal for a public counsel, the Department of Commerce questions the effectiveness of a public counsel as proposed in S. 1321.

As a practical matter, the public counsel could not intervene and participate in any significant number of the 115,000 patent applications examined by the Patent Office each year. The value of a patent is ultimately determined by the marketplace, and is generally difficult to judge from reading the application. Therefore, the public counsel's decision on the cases in which he would participate would likely be no more than a random selection.

Members of the public in a particular industry who are able to determine that a particular invention is significant and wish to oppose it would be permitted to do so under both the administration bill and under S. 1321. However, if the opposer has a real interest in the subject matter, it is likely that he would want to present his case directly, and not through a public counsel as would be required by S. 1321.

We believe, nevertheless, that certain of the functions proposed for the public counsel would be practical and would strengthen the tools of the examiner and improve the examination procedure. Accordingly, the administration bill will contain provisions to ensure the performance of these functions.

Under the administration bill, the Commissioner of Patents would be required to designate an officer of the Patent Office to perform certain limited functions to aid examiners and reinforce the *ex parte* examination proceeding. The bill would empower a primary examiner to request assistance from such officer when the examiner believed it desirable to have an adversary examination proceeding.

The officer would have the right to seek discovery of an applicant and would have other rights and powers of a party in a Patent Office proceeding. While it is expected that such intervention would only occur in a limited number of cases, this additional resource afforded the examiner should strengthen the examination process.

In addition, the Administration bill would provide that all appeals from decisions of examiners to the Board of Examiners-in-Chief would be defended by this officer. This would improve the adversary proceeding before the Board by having the examiner's position presented by another person.

Finally, the Administration bill would codify and strengthen the existing authority of the Patent Office to investigate the conduct of patent applicants, attorneys, and unauthorized practitioners by providing this officer with subpoena power in regard to such investigations. While fraud on the Patent Office or improper conduct by an attorney or agent registered to practice before the Office is, insofar as we know, a rare occurrence, the added authority in the Administration bill should go far to permit prompt and effective resolution of questions of improper behavior when raised.

DEFERRED EXAMINATION

The third subject to be addressed is the establishment of a system for deferred examination of patent applications. Deferred examina-

tion of patent applications has been suggested periodically at least since the early 1960's as a means for overcoming the backlogs faced by patent offices around the world.

A deferred examination system reduces the number of applications requiring examination because some applicants who choose to defer examination of their applications later conclude that their inventions do not warrant examination and permit them to become abandoned.

While S. 1321 provides for a deferred examination system, the bill which the Administration will submit contains no such provision. We believe that a deferred examination system would not be appropriate for the United States.

Serious consideration of a deferred examination system for the United States began in 1966 with a recommendation by the President's Commission on the Patent System. This recommendation was founded in part on an estimate by the Patent Office in 1964 that the then-existing backlog of 220,000 applications and the pendency period of four years would gradually increase until, by 1975, there would be a backlog of 535,000 patent applications with a pendency period of ten years. This projection has not come to pass.

Accordingly, the principal reason for adoption of deferred examination by the Netherlands, West Germany, and Japan, that of a steadily-increasing and unmanageable backlog of applications, does not exist in the United States.

Another, more speculative, benefit suggested by some proponents of deferred examination is that patent office examiners would be required to examine fewer applications, and would, therefore, be able to spend more time on the applications that they did examine, resulting in an increase in the strength and reliability of issuing patents. These proponents point to the experience of the Netherlands patent office, in which only 40 to 45 percent of the applications filed are subjected to full examination. Upon closer analysis, however, it is not believed that the adoption of a deferred examination system can be based on this rationale either.

Initially, it should be noted that the Dutch and other foreign systems for deferred examination differ from the deferred examination proposals contained in S. 1321. Under the Dutch system, the examination process is broken into two stages—search and examination. The Dutch experience has been that a search is requested for approximately 65 percent of all patent applications filed and that subsequent examination is requested for only 40 to 45 percent of the applications filed.

Accordingly, the Dutch deferred examination system saves searching time for examiners in only 35 percent of the applications filed. If the Dutch experience could be directly related to the deferred examination proposal in S. 1321, 65 percent of the applications filed still would be examined since in the United States the search and examination functions are not separated.

We do not believe, however, that the Dutch experience is relevant in the United States. In the Netherlands, approximately 85 percent of the patent applications filed are of foreign origin, compared to approximately 30 percent in the United States. This substantially different mix of home and foreign origin applications is significant.

For most applicants, their home market is the most important and they are more likely to seek the issuance of a patent in their home country before they seek a patent in a foreign country.

Statistics from Japan, where the percentage of home origin applications is more like that of the United States, tend to confirm this.

This is not surprising since filing in foreign countries presents a different picture than filing in a home country. Once an application is on file in a foreign country having a deferred examination system, the applicant need do nothing further in that country for a period of five to seven years while awaiting a decision as to the scope of the protection that he will receive in his home country.

The applicant can also use this period to determine, based on market conditions in the foreign country, whether it is economically feasible for him to utilize the patent in that particular market. Thus, after an applicant has secured a filing date in a foreign country to preserve his option to later obtain a patent, he has many reasons to defer examination.

In view of the foregoing considerations, it is believed that no estimate of what the United States experience would be with a deferred examination system can be based on the Dutch experience.

Furthermore, there have been recent indications abroad that the disadvantages of a deferred examination system may well outweigh their alleged benefits.

The principal disadvantage that has been recognized by those countries having experience with deferred examination systems is that such systems transfer to members of the public the obligation to examine all deferred applications which might possibly be issued later and have an impact on their manufacturing or retailing activities. The effect of this is uncertainty among the competitors of a patent applicant as to whether the subject matter disclosed in the deferred patent application will ultimately be patented. Without knowing whether a patent will be granted, competitors cannot afford to risk the investment required to enter a market. This uncertainty has a paralyzing effect on industry with respect to efforts to produce new products potentially covered by published but deferred patent applications.

It is not an answer that a competitor of the patent applicant may himself cause examination of the deferred application upon payment of a fee to the patent office. The expense of requesting examination of a large number of applications in a given technical field can be prohibitive.

In addition, deferred examination systems are, in one respect, largely self-defeating since deferred applications, including those that later become abandoned, would be published. At least 30,000 search documents, many of dubious value, would be added to the examiners' search files each year, thereby increasing the time that it would take for examiners to perform their searches.

It should also be noted that the deferred examination system could have serious cost consequences for patent applicants since the greater the number of applications abandoned under the deferred system, the greater the fees that would have to be charged for those applications that were examined.

In summary, the administration has not included a deferred examination system in its proposal because it is convinced that the reduction in the number of cases to be examined would be fairly small, and that the real and potential disadvantages flowing from a deferred examination system would far outweigh any benefits of such reduction.

PATENT FEES

Next is the subject of revision of the patent fee schedule, including the establishment of maintenance fees. Recognizing that the benefits of the patent system flow both to the public and individual inventors, it has long been the policy of this country to ask each to support a share of the costs of operating the patent system.

When Congress last adjusted patent and trademark fees in 1965, it was contemplated that the Patent Office should recover through fees from two-thirds to three-quarters of its operating budget. More recently, in the subcommittee print of S. 643, introduced by Senator McClellan in the last Congress, a provision was included that would have given the Commissioner authority to set fees so as to effect an overall recovery for the Patent Office in a range of 65 to 75 percent of its costs of operation. Both the bill the administration plans to introduce and S. 1321 follow this general approach.

S. 1321, however, would also establish a maintenance fee system that presumably would begin the fourth year following patent issuance, with a fee no less than \$1,000, and would require annual fees thereafter, increasing by at least 25 percent each year. Certain exemptions and deferrals would be provided for the payment of filing, examination, and maintenance fees for individual inventors and small businessmen.

In our view, there are serious problems associated with the maintenance fee proposal contained in S. 1321, the most significant of which is that a patentee could be required to pay in excess of \$15,000 to maintain his patent in force for the 12 year term set by S. 1321. It is believed that maintenance fees of this magnitude could seriously impair the proper functioning of the patent system.

The patent system should encourage inventors to commercialize their inventions. With fees of the magnitude that would be required by S. 1321, only patents covering inventions that could be commercialized early, and with anticipation of substantial return, could reasonably be expected to remain in force beyond 4 years from the date of patent issue.

While we recognize that provisions have been included in S. 1321 to ameliorate the stifling effect of these high maintenance fees by permitting certain exemptions and deferrals, it is not believed that these provisions would provide the needed degree of relief. Initially, there are questions of determining how exemptions could be so designed as to encourage individual inventors and small businessmen, and in defining these categories of applicants.

As to deferral, the requirement that an individual establish by a preponderance of proof that he has satisfied the criteria entitling him to deferred payment of the maintenance fee could prove as expensive and as unworkable as the payment of the maintenance fee

itself. This provision would place a continuing obligation on patentees seeking deferral of maintenance fees to re-justify the deferral each year, thus placing an unnecessary and unwarranted burden on both the patentee and the Patent Office. In addition, the possibility of deferring payment of maintenance fees under S. 1321 is limited to 10 years. This limitation could prove to be particularly harmful to the owner of inventions whose time has not yet come, especially if a patent term of 20 years is adopted. Many of the great inventions that we now enjoy took many years to commercialize and did not enter our lives and industries until long after their patenting.

A study of inventions by the Batelle Columbus Laboratories under a grant by the National Science Foundation revealed that it took an average period from first conception to market realization of 19.2 years. Moreover, the study found no evidence that the time from conception to commercial realization was becoming any shorter. Accordingly, it is clear that the maintenance fee system of S. 1321 would work to the detriment of the public by depriving it of the commercialization of some very significant inventions. In addition, it should be noted that while maintenance fees can be used to increase revenue for the Government, they do not do so without adding significant costs to administer the collection of fees.

Also, while cost to the Patent Office of administering the maintenance fee system of S. 1321 cannot be predicted with any accuracy, it is certain that the cost of administering such a system would exceed \$1 million annually, and that patentees themselves would incur expenses of at least an equal amount.

There is some desirability, however, in encouraging patent owners to surrender to the public those patents that they are not using and are not making good faith and diligent efforts to commercialize. The bill the administration will introduce contains such an incentive.

Under the administration bill, patentees would be required in situations where there was no use of the patent and no evidence of any diligent or good faith effort to commercialize it, to pay reasonable fees if they wished the patent to remain in force. Specifically, at the 10th and 15th anniversaries from the filing date of the patent, a patentee would be required to file a verified statement with the Patent Office indicating whether he or his licensee was making, using or selling the patented invention, or whether he was diligently and in good faith trying to commercialize the patented invention.

If the patentee could not make such a statement, he would pay a fee of \$1,000 on the 10th anniversary, and \$2,500 on the 15th anniversary to maintain his patent in force.

Under the administration bill, inventors of limited means having difficulty commercializing their patented inventions would never need worry about having to pay a fee to maintain their patents in force, as long as they were engaged in diligent and good faith efforts to commercialize their inventions. Accordingly, it is unnecessary under the approach that the administration will take in its bill to provide exemptions for independent inventors and small businessmen.

In addition, where patentees are successful in commercializing their inventions, no maintenance fee would need be paid. Since the statement of commercialization or good faith effort called for under

the administration bill would only be due twice during the term of the patent, the administrative problems of the administration's proposal will be significantly less than those of S. 1321.

INDEPENDENT AGENCY

Finally, we have the subject of administrative restructuring of the Patent Office, including the proposed establishment of the Patent Office as an independent agency. There have been recurring suggestions that the Patent Office be made an independent agency within the executive branch rather than a bureau within a cabinet level department. Notwithstanding these suggestions and the inclusion of such a proposal in S. 1321, it is believed that the Patent Office should remain a component of the Department of Commerce.

Accordingly, the administration will continue the present arrangement in its bill.

One of the more important administrative developments in recent years has been the trend toward organization of the myriad Federal agencies on a functional basis. Due to several factors, there is a growing realization that the activities of the Federal Government which contribute to a particular goal should be grouped together to achieve that goal. The importance of such organization by function was central to President Nixon's Executive Reorganization Plan proposed to the 92d Congress.

One vital mission of the Department of Commerce is the promotion of industry, science and technology. The role of the patent system—of which the Patent Office is the heart—is to promote technological and industrial progress by providing effective incentives to invention and innovation and by bridging the technological and business communities.

The Patent Office also performs a function of great and direct commercial significance in the examination and registration of trademarks, which often are among the most valuable and important assets of a business.

These two principal activities of the Patent Office are, therefore, most compatible with and represent an essential part of the total spectrum of integrally related means by which the Department of Commerce carries out its mission of promoting the Nation's industrial and economic strength.

As part of the Commerce organization, the Patent Office enjoys enhanced operational efficiency. It relies heavily on the services and resources which are centralized in the Department of Commerce. If the Patent Office were an independent agency, it would need to duplicate all or most of these services and resources, less efficiently and more expensively in terms of both staff and cost.

Another benefit of the present arrangement is the independent management performance evaluation which the Patent Office receives as a component bureau within the Department of Commerce. Under this arrangement, the Patent Office is continually called upon to evaluate and define its goals in terms of management by objective, to offer coherent plans for achieving them, and to account for any failure to achieve these goals.

By being in the mainstream of the executive branch, the Patent Office is also better able to represent the concerns and interests of patent owners, and more effectively to make available to the President the benefit of the complete views of the interested sectors. For example, 3 years ago the Patent Office was able to bring to the attention of the President its potential for contributing to his environmental quality policy, thus permitting the President to take the affirmative steps that the Patent Office had identified to him.

Perhaps a fundamental assumption underlying proposals that the Patent Office be an independent agency within the executive branch is that, as part of a larger organization, the Office is subject to undue influence and pressures from its parent agency. It is reasoned that if the Patent Office were a separate agency, this "influence from above" would be eliminated. However, we are aware of no evidence in the history of the Patent Office which would suggest that any improper influence was exerted upon the Patent Office by officials in the departments to which the Office has been attached. To the contrary, the Patent Office has enjoyed freedom and latitude in its operations.

In view of the many sound reasons for the Patent Office continuing to be an agency within the Department of Commerce, and the complete absence of any reasons or evidence suggesting that it be removed, the bill that the administration will submit will continue the present relationship.

That concludes my statement. Thank you for the opportunity to present the views of the Department of Commerce, Mr. Chairman.

Senator HART. Thank you very much for an effective summary of the full testimony.

Let me react generally first. Then I, and I'm sure staff will have questions on the specifics.

I was just leaning over to talk to Mr. Brennan, staff counsel, to refresh my recollection on when we really began in Congress to try to reform the patent law. The immediate history goes back to about 1967 in reaction to the President's report, and we have been up and down the Hill ever since. Largely because of the concern and interest of Senator McClellan, we are committed for this session of this Congress to attempt to report a bill out.

The Department of Commerce and the administration have been partners in the effort to move us. I would like to talk to you as one partner to another. You have described the administration's position on a great many of the specific areas that were identified for discussion in this hearing. You have given us your position at least as a matter of principle on the five areas of our concern in hearings.

From what you tell us and from information that we have, it is my impression that the administration bill would be fairly labelled a progressive one; but this committee should have it in time to permit it to inhale fully the implications, to give it the kind of study that the subject warrants.

The record of this hearing closes September 28th, and the staff will begin its markup October 1st, and Senator McClellan is very anxious that a reform bill be reported out before the recess, and without anybody taking blood oaths, this is to occur October 15th.

Now, given that timeframe, one partner is asking the other, let us have what you have got. As I understand it, your bill is virtually ready, except for working out the antitrust aspects. The decision first is whether to come in with a bill that provides antitrust features, and if you decide you shall, what form.

Secretary Dent told some of us on the subcommittee that he would send up the administration bill, reform and antitrust, by, as I recall it, the end of October. If the decision of the administration was not to include antitrust, the bill could be to us by about the first of October.

I am not going to get into any extended discussion about whether it is logical that the reform of the system for issuing patents have also specific rules with respect to patent licensing. There is disagreement on that.

I remember in 1971 the subcommittee did report a good reform bill, but because of the controversy surrounding the antitrust exemption provisions, the bill got noplacement. My feeling is that if patent reform has tied to it the antitrust treatment again, reform would be impaired and certainly delayed. That's one partner's impression conveyed to another, all in good spirit.

With less good spirit, but nonetheless in good spirit, this administration is telling Congress that we ought to cooperate. You should be willing to give a congressional committee the bill as it is now developed.

If you want, say in another month, give us what you think we ought to do with antitrust. At least it would give us several weeks to appraise the reform features that you have.

Mr. BAKKE. Mr. Chairman.

Senator HART. Withholding is not a dramatic example of cooperation.

Mr. BAKKE. May I say, Mr. Chairman, that the administration is totally in sympathy with the objective of the subcommittee in having a reform bill reported out to the full committee before adjournment. The question of timing with respect to transmittal of the administration bill is linked in large measure to the target date for adjournment. We have had discussions here on the Hill as recently as last week on whether submission of a bill to the subcommittee by the end of October would be timely. There was some real question in the minds of those with whom we spoke concerning the realities of the Senate looking toward early adjournment, and it was felt that submission of an administration bill by the end of October, given the realities of the workload before the Congress, would be timely to permit the subcommittee to give careful and deliberate consideration to the administration position and to have reported a reform bill before adjournment.

If, in fact, the schedule for adjournment has been accelerated and October 15 appears to be the date, certainly in light of that development the administration is prepared to reexamine the question of timing for submission.

Senator HART. I hope I was careful not to state under oath that we will adjourn on October 15. As late as yesterday noon in the Policy Committee, in discussion of Senator Mansfield's request that

we do our best. I base my judgement. I don't want to have my earlier remarks misinterpreted.

When Secretary Dent visited me, I expressed the thought that it would make great sense not to put any antitrust items in it. If it got in by the 30th of October, we would probably at least be able to vote on it, but we are all entitled to some second thoughts, and I have two second thoughts. One, October 30 is 15 days later than the Policy Committee has staked out to be our goal as of yesterday, and even without that, it would just seem to me to make good business sense that the subcommittee and its staff be given the statutory recommendations that you have developed as of now with the clear understanding that the antitrust provisions that are being developed, when worked out, can then be sent to us. Then at least we would have a chance to wrestle with the procedural reforms long before we otherwise would, if you continue to fight out the antitrust provisions.

I hope you will give it a rethinking.

Mr. BAKKE. We will certainly take your views into careful consideration, sir.

Senator HART. Let's turn to patent reform.

Yesterday, I think the testimony suggested that for a number of reasons, less than the highest quality of patents do issue from the Patent Office. Of course the same can be said for legislation of Congress. Identifying among the factors that contribute to a track record that includes a substantial volume of bad patents are the ex parte nature of the proceedings, inadequate search facilities, applicants who do not fully disclose, and an inadequate amount of examination, an average of 15 hours for each patent.

That a crisis atmosphere exists, I think is not surprising. At least it would not be an unfair characterization. Again, although we do not have the specifics of your bill, it does seem to me from your testimony that the administration bill moved toward reform in each of these areas, and that is the goal of all of us.

We want a Patent Office that turns out good patents and rejects inferior ones, and does that in a time frame that is the best that human hands can develop.

You oppose deferred examination because the backlog has been reduced from 36 months to 23 months. Yesterday some of the witnesses said that the average pendency went down because you were turning out lower quality patents.

How do you figure that pendency rate? How do you calculate that?

Mr. BAKKE. Mr. Chairman, may I ask the Patent Office personnel to respond to that question?

Senator HART. Certainly.

Mr. TEGMEYER. Your question was how do we determine the pendency rate in the Patent Office? For the purposes of answering the question, we might define what we mean by pendency rate when we speak in terms of a 23-month pendency rate at the present time. We mean that's the average time required to issue patents. This does not take into account the time required for applications to become abandoned because of a rejection by the Patent Office or, in a few cases,

for other reasons. It's the average amount of time between the date of filing the application and the date that the patent issues.

Senator HART. Commissioner Tegtmeyer—and I appreciate that you responded very fully to my request for information on the operations of the Patent Office—if there's no objection, I would like to make those responses a part of the record.

[The information referred to follows:]

U.S. DEPARTMENT OF COMMERCE,
PATENT OFFICE,
Washington, D.C. August 31, 1973.

HON. PHILIP A. HART,
U.S. Senate,
Washington, D.C.

DEAR SENATOR HART: I am writing in reply to your letter of March 19, 1973, to former Commissioner of Patents Robert Gottschalk. As you can appreciate, your inquiries about factual and policy matters, and the need for compilation of extensive statistical information, required considerable time for a meaningful response.

The Administration is now developing patent reform proposals for transmittal to the Congress. Deliberations looking toward draft legislation include questions relating to patent licensing provisions. It is expected that the Administration's reviews will be finalized shortly. However, until the Administration position has been formulated, it would be difficult, if not inappropriate, for the Department of Commerce to provide substantive comment on your draft licensing bill.

The appendices to my letter furnish the factual and statistical information requested in your letter. I believe these appendices are self-explanatory. They comprise four items A through D, B and D of which include four parts each. Each appendix recites the basis for its compilation as well as necessary explanatory remarks for its interpretation.

You also requested identification of each important policy dispute over the past ten years involving reversal by the United States Court of Customs and Patent Appeals of a Patent Office position, and the reasons the Patent Office did not pursue a further appeal. I regret that we are unable to identify with certainty the three cases you have in mind. We will, of course, respond if you would identify the cases.

May I point out that only for the last seven years has it been settled that the Supreme Court would review a decision of the CCPA. Prior to *Brenner v. Manson*, 383 U.S. 519, decided in 1966, the Supreme Court had uniformly refused to grant certiorari to review a case arising from a decision of the CCPA. Since then, the Court has granted certiorari with respect to two cases decided by the CCPA on petitions filed by the Solicitor General on behalf of the Patent Office. *Brenner v. Hofstetter*, 389 U.S. 5 (1967) (which was vacated as moot) concerned the resolution of doubt as to patentability, and *Gottschalk v. Benson*, 409 U.S. 63 (1972) involved the patentability of a program to be performed on a digital computer.

You are aware, of course, that the Commissioner of Patents alone does not have the final authority to decide whether a petition is filed in a given case, although his recommendation is given due consideration. The Solicitor General, with whom the power of decision rests, is quite discriminating in deciding whether to file a petition, bearing in mind the particular criteria for certiorari specified in Supreme Court Rule 19.

There are still other factors which are taken into account in determining whether to seek the filing of a petition for certiorari. The Patent Office often does not believe it can make a strong enough case to justify further review. Other cases where the Patent Office is overruled, are not judged sufficiently important to request the Solicitor General to petition for certiorari.

I believe your reference to "disputes" between the Patent Office and the CCPA may distort our relationship. Our primary concern is the granting of valid patents to promote the progress of the useful arts, while assuring protection of the public interest. We are, of course, occasionally confronted with a novel legal question or case of first impression. In these situations, we think

that our duty to the public demands judicial guidance, particularly in cases of significant importance for the proper functioning of the patent system. Although we don't always agree with the CCPA reversing our position, we regard such a reversal as a clarification of the law rather than a "dispute".

I trust that we have responded to your questions on these important matters.

Sincerely,

RENE D. TEGTMEYER,
Acting Commissioner of Patents.

U.S. SENATE,
COMMITTEE ON THE JUDICIARY,
SUBCOMMITTEE ON ANTITRUST AND MONOPOLY
Washington, D.C., March 19, 1973.

HON. ROBERT GOTTSCHALK,
*Commissioner, Patent Office,
Department of Commerce,
Washington, D.C.*

DEAR MR. GOTTSCHALK: As you know, substantial controversy surrounded legislation introduced last Congress which would have substantially circumscribed the applicability of the antitrust laws to licensing of patents. Proponents argued existing law was uncertain and legislation was necessary to codify long established Supreme Court precedent. Opponents convincingly argued that present law is reasonably certain and that the alleged codification would change existing law and legalize conduct now held to be unreasonably restrictive of competition and thus illegal. The Patents, Trademarks, and Copyrights Subcommittee voted 3 to 2 against including these proposals in the Patent Reform Bill (S. 643).

Attorney General Mitchell, Assistant Attorney General McLaren, and the Federal Trade Commission vigorously opposed the proposals, agreeing with a distinguished group of scholars and lawyers, including former Attorney General Herbert Brownell, past American Bar Association President Bernard Segal, and some 40 law school professors. The Department of Justice also outlined how a number of pending Government lawsuits would be seriously prejudiced—and probably lost—if the proposals were adopted.

After listening to much argument before, during, and after the Subcommittee vote, I believe that it would be a mistake to enact any legislation governing the applicability of the antitrust laws to licensing of patents. However, carefully drawn and well intentioned, such a codification of necessity must limit and rigidify the law. This would make it very difficult—if not impossible—for the courts and enforcement agencies to respond adequately to new and changing economic and technological conditions. Formulation of specific statutory rules almost invariably leads to the creation of loopholes, which can become the basis for exempting what otherwise would be improper and anticompetitive behavior.

In this complex and delicate area, I have much greater faith in judicial determination of specific issues on a case-by-case basis—where two parties, with a financial stake, a specific factual problem, and the best counsel they can find argue the limited and precise issues. Also, I fear that statutory codification would act as a basis for more, rather than less, uncertainty and litigation.

Because I do feel this strongly, I am certainly reluctant to propose any legislation in this area. However, patent reform will be proposed again this Congress, and it is likely that exemptions of contracts involving the licensing of patents from the antitrust laws will be discussed. If such proposals are put forth, in order to protect the antitrust laws, I would like to suggest an alternative way to cope with the problem, which I shall then introduce.

The bill enclosed is my current suggestion as to how this might be accomplished.

It reflects much of last year's testimony—especially that of Assistant Attorney General McLaren. Essentially, it provides certainty in recognizing and codifying well-established principles and would afford businessmen the benefit of a fair and balanced rule of reason test for those many areas where the

courts have not enunciated rules of per se illegality. Cast as amendments to the Federal Trade Commission Act, the bill should remove the legitimate concern of businessmen about uncertainty in the law and should provide appropriate guidelines to the courts in their day-to-day decisions on specific issues without legitimizing anticompetitive conduct.

Overall patent reform bills—including mine—will soon be before the Senate. At that time, I will request a formal expression of your views on those proposals. However, in the near future—or at least no later than the time you supply your views on the formal bills—I would appreciate having your opinion on the enclosed draft bill. Please look at it both as to approach and language.

With respect to production and use of time by Patent Office examiners, it would be useful to have each examining group identified and the following information supplied for each group for each of the past five years: number of examiners; number of office actions made; number of appeals taken; and number of patents issued. It would also be helpful to have whatever information the Patent Office has on the ownership and origin of patent applications and issued patents for the past ten years. This should include statistics of domestic and foreign ownership (by country and industry), corporate and individual ownership (by industry), assignments to governments or corporations, and any other data available to the Patent Office concerning the source and ownership of both patents and applications.

In addition, you receive by statute information on court actions relating to issued patents (35 U.S.C. § 290). It would be very useful to have summarized the past 5 years of patent litigation in the Federal courts, both at the District Court and Appellate level—the number and identification of cases and patents litigated, the holdings and rate of patent validity and invalidity, the holdings of infringement, the holdings of misuse, and the holdings of fraud or inequitable behavior (and the specific grounds therefor). Please indicate which of these litigated patents were subject to appellate review during patent prosecution—whether before the Board of Appeals, the Board of Interference Examiners, C.C.P.A., or otherwise. It would also be helpful if you would identify separately, for the past 5 years, the appeals taken to the C.C.P.A. and to the U.S. District Court for the District of Columbia, from the Board of Appeals or the Board of Interference Examiners. For each such appeal, please indicate the outcome of the case and whether or not the Patent Office position was upheld.

Finally, I understand that over the past 10–15 years the patent examining staff and the Board of Appeals have taken positions on a number of important issues of patent policy that have been reversed by the C.C.P.A. In three such cases, the Patent Office has not sought authoritative resolution to such disputes between its professional examining staff and the Board of Appeals, on the one hand, and the C.C.P.A., on the other. I would like to have identified, for the past 10 years, each such important policy dispute that has involved a C.C.P.A. reversal of the Patent Office's position and the reason for not pursuing further appeal to the courts.

Your cooperation and assistance in these important matters would be deeply appreciated.

Sincerely,

PHILIP A. HART,
Chairman.

Enclosure.

A BILL To Supplement the Federal Trade Commission Act by Amending it to Increase Competition, Promote Interstate and Foreign Commerce, Prevent Unreasonable Restraints on Commerce and the Commercial Working of Technology Advancements, and for Other Purposes

[Insert title of bill here]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Act entitled "An Act to create a Federal Trade Commission, to define its powers and duties, and for other purposes," approved September 26, 1914, as amended (15 U.S.C., Secs. 41–58), is hereby amended by adding at the end of section 5(a) thereof the following new paragraphs, to read as follows:

"(7) It is hereby declared an unfair act or practice subject to this Act, an inequitable practice, and an agreement in unreasonable restraint of trade for any owner, applicant, or licensee (including sublicensee) of a United States

patent to enter into any patent licensing arrangement affecting commerce, which provides, includes as one of the terms thereof, or which is subject to any understanding that the licensee is to:

"(A) Fix, adhere, to, or otherwise maintain any price with respect to the sale of any product, service, or other thing of value; or

"(B) Purchase or otherwise secure unpatented or patented products, services, or other things of value from the licensor or from any person designated by the licensor; or

"(C) Accept a license under one or more additional patents; *provided, however*, that no such provision which is adopted for the convenience of the licensee and solely at his instance, which is subject to renegotiation in good faith for fewer patents and a lower royalty, and which is otherwise noncoercive shall be deemed to be unlawful *per se* pursuant hereto; or

"(D) Refrain from dealing in any product, service, or other thing of value not within the scope of the patent, or cause any other person not to do so; or

"(E) Be restricted or limited, directly or indirectly, in the resale of products which such licensee has purchased, or impose any such restriction or limitation on another person; or

"(F) Have the power to determine or participate in determining whether the licensor shall enter into license agreements with any additional licensee or licensees; *provided, however*, that nothing herein shall be construed to prohibit the grant of a sole and exclusive license with the right to sublicense; or

"(G) Grant to the licensor or to any person designated by the licensor an assignment of or exclusive license under any patent which may be issued to the licensee after the patent licensing arrangement is executed; or

"(H) Pay royalties to the licensor in an amount not reasonably related to such licensee's sales or utilization of the subject matter of the licensed patent; *provided, however*, that no provision for the payment of minimum or lump-sum royalties shall be deemed to be unlawful *per se* pursuant hereto.

"(I) It shall not be deemed an unfair method of competition in commerce, an unfair act or practice in commerce, an inequitable practice, nor an agreement in unreasonable restraint of trade, for any person to enter into or maintain in effect a contract providing for a license which is limited to less than the licensor's entire right in (or which is otherwise subject to any limitation, condition, agreement, or understanding with respect to) any technology or other form of intellectual property (whether or not the same is patented or copyrighted, and whether or not the effect of such limitation, condition, agreement or understanding may be substantially to lessen competition or tend to create a monopoly in any line of commerce in any section of the country) provided such limitation, condition, agreement, or understanding (i) is ancillary to the main purpose of a lawful contract, (ii) is no greater in scope and duration than necessary to achieve such purpose, and (iii) is otherwise reasonable in the circumstances. The extent, if any, to which the effect of such limitation, agreement, or understanding may substantially lessen competition or tend to create a monopoly in any line of commerce in any section of the country shall, however, be considered together with the extent such limitation, condition, agreement or understanding actually promotes the progress of science and useful arts, in determining whether such limitation, condition, agreement, or understanding is otherwise reasonable in the circumstances.

"(J) It is hereby declared an unfair act or practice subject to this Act, an inequitable practice, and an agreement in unreasonable restraint of trade for any person to enter into or maintain in effect any contract, agreement, or understanding affecting commerce and involving the transfer or utilization of technology or any other form of intellectual property (whether or not the same is patented, copyrighted, or considered a trade secret) which provides for the payment of a running royalty (whether based on a fixed or varying percentage of sales; on the number of units or quantity manufactured, used, or sold; or on any other measure of degree or duration of utilization of the same) for the use of the same after the time that the same has fallen into the public domain.

"(K) Every person who has granted a license with respect to any United States patent, affecting commerce, shall, within ninety days thereafter, file with the Commission a copy of such license and the name and address of the person granted such license together with all other agreements or understandings in connection therewith. Failure to make such filing shall be deemed an unfair act or practice subject to this Act, resulting in forfeiture of the patent

and such other relief as the Commission may deem appropriate, and an inequitable practice. The Commission shall promptly publish a list of such licenses and licensors, and shall make available copies of such licenses, deleting the names of licensees."

Sec. 2. The Commission is authorized and directed to define any and all terms used herein, and otherwise to prescribe such procedural and substantive rules and regulations as may be necessary or appropriate for carrying out the purposes of this Act. The Commission, acting through its own attorneys, is authorized and directed to seek injunctive and such other relief as may be necessary or appropriate to prevent violation of any provision of this Act or of any rule or regulation promulgated hereunder, in any court of competent jurisdiction. The Commission shall further have all powers and enforcement duties with respect to unfair acts or practices subject to this Act as it does respecting unfair methods of competition and unfair acts or practices in commerce, and the provisions of the Federal Trade Commission Act (15 U.S.C., Secs. 41-58) shall otherwise be fully applicable with respect to unfair acts or practices subject to this Act.

Sec. 3. The Office of Management and Budget shall not inspect, examine, audit, or review the subpoenas, general or special orders, records, work, or congressional recommendations or testimony of the Commission or any member thereof or comment on any budget request made by the Commission, any other provision of law to the contrary notwithstanding. The Comptroller General shall conduct such reviews, audits, and evaluations of the Commission as he deems necessary. All accounts, budgets, and records of the Commission shall be submitted to the General Accounting Office from time to time as the Comptroller General may require, and the Commission shall maintain, preserve, and make available for inspection by the General Accounting Office such records as the Comptroller General may require.

Sec. 4. Any act or practice defined by this Act as an agreement in unreasonable restraint of trade shall also be deemed such for the purposes of any act to protect trade and commerce against unlawful restraints or monopolies or to supplement the same.

Sec. 5. If any provision of the Act or the application of such provision to any person or circumstance is held invalid, the remainder of this Act shall not be affected thereby.

Sec. 6. This Act shall become effective 90 days after the enactment thereof. It shall apply to all United States patents, whether issued before or after the effective date of this Act.

For release ; Thursday A.M.'s

MARCH 22, 1973.

Senator PHILIP A. HART,
Senate Office Building,
Washington, D.C.

A bill to overhaul the patent system for the first time since 1836 will be introduced by Senator Philip A. Hart (D-Mich) today.

"The patent system—as spelled out in the Constitution—is supposed to offer bait so that inventions will be developed—and implemented—for the public good," Hart said. "But given its intended purpose, the U.S. patent system cannot be described as a success. The evidence is strong that our system tends to frustrate invention and tie up technology so the public can't benefit from it."

Hart said the system was designed to deal with a few hundred inventions a year—coming mostly from individuals.

"In today's corporate-dominated", technology-oriented world, only 20 of 100 patents granted go to individuals; and the annual burden of applications has risen to 100,000."

Currently, there is a "two-and-one-half year backlog in the Patent Office.

"Worse, patents are being handled by this creaky system in such a way that 72 percent of those litigated in the Federal Courts of Appeals are held invalid, and fewer than 20 percent of the litigated patents are upheld as valid and infringed," said Hart.

Hart's bill would make these significant changes in the current system :

1. The Patent Office would be independent.

2. Secret sessions wherein "patentability" is decided would be replaced with public adversary hearings.

3. A Public Counsel in the Patent Office would argue for the public interest.

4. The Office would have subpoena, investigative, and research powers to determine the patentability of an invention independently.

5. Examination could be deferred for up to five years, with patent protection lasting 12 years, plus the time lapse from filing to examination. Fees would be low at filing and rise only when the patent was put to work.

6. An oath would be required that all material information, which would adversely affect the issuance of the patent, is brought to the attention of the Office.

Hart is a member of the Patents, Trademarks, and Copyrights Subcommittee of the Judiciary Committee.

"The patent system is essential to the Nation. But at this time it is on a self-destruct course. We can't let this continue," said Hart.

FLOOR REMARKS OF SENATOR PHILIP A. HART, ON INTRODUCING PATENT REFORM ACT OF 1973

Mr. President: If we were measuring the "potential boredom rate" of various topics for conversation on a scale of 1 to 100, patents would probably get a 99.

Except for a few thousand patent lawyers, employees of the Patent Office, and some scattered scholars, few topics are more likely to result in tuned-out listeners.

If you asked the average college student what a patent is, he would no doubt tell you it is a reward—compensation for the long, lonely, financially strapped hours some individual attic inventor worked on his creation.

That answer would be partially right. A patent is a "reward" but more in the sense of "incentive" than "compensation." It is, in effect, more like the \$100,000 offered in a community for information that may lead to the solution of an especially heinous crime.

In other words, as spelled out in the Constitution, the underlying principle of the patent system is to offer bait so that the inventions will be developed—and implemented—for the public good.

Given its intended purpose, the U.S. patent operation cannot be described as a success.

For the evidence is strong that our system tends to frustrate invention and tie up technology so the public can't benefit from it.

Basically, this is because we are limping along today on a system designed in 1836—when the few hundred inventions did come chiefly from the Thomas Edisons and other individuals.

In today's corporate-dominated, technology-oriented world, only 20 of 100 patents granted go to individuals; and the annual burden of applications has risen to 100,000.

Not surprisingly, there is a two-and-one-half year backlog in the Patent Office.

Worse, patents are being handled by this creaky system in such a way that 72 percent of those litigated in the Federal courts of Appeals are held invalid, and fewer than 20 percent of the litigated patents are upheld as valid and infringing.

And the casebooks are teeming with examples of patents filed to "protect" or extend the life of other patents—which too often is a way of saying to close out innovation—and of patents which are simply frivolous and fanciful with little or no redeeming public good.

Not only do such patents add to the burden of the Office, but they increase the financial burdens for those who would bring forth a worthwhile idea. For each adds a new blockage to the ongoing stream of technology and adds to the mass that must be researched to determine if an idea is indeed "new" and patentable.

Mr. President, the Executive and Congress have not been derelict in their duty to attempt to do something about the situation. For six years, dating back to President Johnson's Commission on the Patent System, much thought and work has been given to this matter. In fact, the Senate Patents, Trademarks and Copyrights Subcommittee, under the able leadership of the Senator from Arkansas, Mr. McClellan, in 1971 reported a bill to reform the system.

The bill was a compromise—embracing 14 of the 35 recommendations of the Johnson Commission—omitting the more controversial. But the bill moved no further than the subcommittee.

Last year, President Nixon recognized the importance of a viable patent system, saying that "a strong and reliable patent system is an important predicate to U.S. technological progress and industrial strength."

I couldn't agree more. And frankly, I am troubled as to how much the archaic patent system is contributing to the lessening of our traditional technological lead. The United States alone has not recognized the changed technological and economic factors of today's world since 1836.

Today, I propose an omnibus bill to reform this system and to make it fit to deal with the technological potential of this country—and a number of these proposals already are operating quite successfully in Europe.

The bill recognizes that patent monopoly grant is a carefully delineated privilege designed to serve the public interest in promoting the progress of science and useful arts and not an unlimited license to the recipient. Let me highlight some of the significant features of the bill.

First, the Patent Office would be made independent, divorcing it from the interests of the Commerce Department.

Second, secret *ex parte* sessions wherein interested parties and a patent examiner decide the patentability of an idea would be replaced with public adversary hearings.

Third, a Public Counsel would be installed in the Patent Office—to argue for the Public interest and to make the Office itself simply judge instead of both judge and advocate.

Fourth, the Patent Office is given subpoena, investigative, and research powers to it may independently, and with great assurance, determine the question of patentability before—rather than after—issuance of the patent.

Currently, the Office relies on information supplied by the applicant. Under the present system, the average patent receives a total of about 15 hours of review.

The new procedures would allow a full airing of the facts and hopefully enable the Patent Office to deny patents that today are being found invalid in the courts in such great numbers.

Fifth, the bill adopts a method common in European countries to relieve the financial burden on applicants and lessen the Office's workload.

Examination could be deferred for up to five years after filing. Therefore, protection for the invention is gained; but there is no need for the Office to handle inventions that in fact are never going to be put to use.

Under this system in Holland, it is estimated that at the end of the deferred examination period, some 59 percent of the applicants chose to let their applications lapse.

Under the deferred examination system, fees would be small at the time of filing and not become substantial until the patent is actually put to work and the inventor can properly afford them.

This would open the door a little wider for individual applicants who are almost strangers to the Patent Office today.

The patent grant would be for 12 years from filing, plus whatever time elapsed while the examination was deferred.

Sixth, an oath would be required to assure that all material information which would adversely affect the issuance of the patent is brought to the attention of the Office. As the invalidity track record in the courts has demonstrated, currently many applicants have been less than candid with the Office as to the facts surrounding the issuance of the patent.

The oath puts more of an obligation for disclosure on the one seeking the patent monopoly, akin to standards before the Securities and Exchange Commission; and the other new procedures in the bill help the Office develop information to assure that patents will be granted on facts, not fiction.

Mr. President, as I said, I know that discussion of patents can be tedious. However, I'm sure that most members of this body would agree with President Nixon that we must have a strong and reliable patent system in order to promote invention and the public interest.

It is a matter not only of life style and comfort for each of us, but of health, employment, and maintaining our technological superiority. In sum, I believe that reform of the patent system is a necessary prerequisite to restoring public confidence and allowing it to perform its constitutional objective.

In short, a dull but essential piece of business; and one I hope Congress will complete this year. I ask unanimous consent that the Patent Reform Act of 1973 be printed in the record at this point.

PATENT OFFICE REPLY TO SENATOR HART'S LETTER OF MARCH 19, 1973

Appendix A

INTRODUCTION

Your letter asks:

"With respect to production and use of time by Patent Office examiners, it would be useful to have each examining group identified and the following information supplied for each group for each of the past five years: number of examiners; number of applications pending; number of applications received; number of office actions made; number of appeals taken; and number of patents issued."

Information in response to this portion of your inquiry is supplied in the six tables which form Appendix A.

PATENT EXAMINING GROUPS

CHEMICAL EXAMINING GROUPS

Group	Technology examined
110	General chemistry and petroleum chemistry.
120	General organic chemistry.
140	High polymer chemistry, plastics, and molding.
160	Coating and laminating, bleaching, dyeing, and photography.
170	Specialized chemical industries and chemical engineering.

ELECTRICAL EXAMINING GROUPS

210	Industrial electronics, physics, and related elements.
220	Special laws administration.
230	Information transmission, storage, and retrieval.
250	Electronic component systems and devices.
280 ¹	Photography, sound, and lighting, indicators and optics, measuring and testing, geometrical instruments.

MECHANICAL EXAMINING GROUPS

310	Handling and transporting media.
320	Material shaping, article manufacturing tools.
330	Amusement, husbandry, personal treatment, information.
340	Heat, power, and fluid engineering.
350	Miscellaneous constructions, textiles, and mining.
360 ²	Textiles, cleaning, and fluid handling.

¹ Group 280 was abolished on June 26, 1972, and a new group (240) was established. The technology examined in group 240 is receptacles, sanitation and cleaning, winding, and measuring.

² Group 360 was abolished in March 1970.

AVERAGE NUMBER OF EXAMINERS IN EACH EXAMINING GROUP

[Fiscal years 1968-72]

Group	1968	1969	1970	1971	1972
110.....	75	80	75	77	77
120.....	84	86	80	81	85
140.....	85	80	78	78	75
160.....	81	92	93	93	87
170.....	68	71	77	81	78
210.....	64	72	68	62	56
220.....	32	27	30	40	37
230.....	69	92	92	93	87
250.....	87	98	85	78	70
280.....	60	60	56	57	52
310.....	84	68	75	93	91
320.....	68	64	68	74	73
330.....	72	67	67	72	74
340.....	64	53	66	85	78
350.....	70	55	72	102	103
360 ¹	80	67	33	(¹)	(¹)
Corps.....	1, 143	1, 132	1, 115	1, 166	1, 123

¹ Group 360 abolished in March 1970.

NUMBER OF APPLICATIONS PENDING BY GROUP

[Fiscal years 1968-72]

Group	1968	1969	1970	1971	1972
110.....	13,420	12,869	12,304	11,697	10,937
120.....	18,422	19,168	19,793	21,059	19,939
140.....	15,012	14,178	14,081	13,443	14,187
160.....	14,806	13,946	12,933	13,696	15,226
170.....	11,215	11,183	10,956	11,383	10,746
210.....	9,930	8,816	8,217	7,515	7,229
220.....	3,820	3,850	7,219	7,941	4,214
230.....	11,856	11,238	10,610	9,827	9,342
250.....	14,288	12,871	11,398	10,026	8,754
280.....	7,758	7,765	7,505	7,191	6,774
310.....	12,984	14,093	16,020	15,886	15,887
320.....	12,439	12,519	12,393	12,041	12,399
330.....	12,991	12,579	12,974	12,176	11,894
340.....	8,600	8,554	12,883	13,283	14,963
350.....	10,428	10,546	16,439	16,962	18,769
360 ¹	11,940	10,487	1,714	(¹)	(¹)
Corps.....	189,909	184,662	187,439	184,126	181,260

¹ Group 360 was abolished in March 1970.

APPLICATION RECEIPTS BY GROUP

[Fiscal years 1968-1972]

Group	1968	1969	1970	1971	1972
110.....	5,539	6,107	6,253	6,108	6,004
120.....	7,297	7,846	8,041	8,545	8,479
140.....	5,645	6,095	6,506	6,382	10,021
160.....	4,857	5,397	5,316	6,224	6,868
170.....	4,782	5,297	5,226	5,786	4,590
210.....	4,934	4,879	5,120	5,901	4,951
220.....	2,425	2,369	4,109	3,993	2,502
230.....	3,942	4,068	4,963	5,211	5,286
250.....	5,811	5,942	6,426	6,312	5,140
280.....	4,061	4,674	4,509	4,940	4,428
310.....	9,247	10,167	9,880	9,999	9,604
320.....	6,330	6,623	6,553	7,137	6,849
330.....	5,998	6,863	7,095	6,888	6,711
340.....	6,271	6,518	7,168	9,157	9,339
350.....	6,792	7,422	9,355	11,577	11,948
360 ¹	6,731	6,554	4,054	(¹)	(¹)
Corps.....	90,662	96,821	100,574	104,160	103,120

¹ Group 360 abolished in March 1970.

NUMBER OF OFFICE ACTIONS MADE BY GROUP

[Fiscal years 1968-1972]

Group	1968	1969	1970	1971	1972
110.....	15,156	15,634	16,673	22,073	17,373
120.....	19,286	20,136	22,147	23,034	24,147
140.....	17,736	17,143	18,336	23,926	17,610
160.....	12,083	13,835	16,151	17,688	16,317
170.....	11,751	12,760	13,011	13,999	13,350
210.....	10,962	12,357	12,448	12,904	12,351
220.....	7,411	6,324	6,470	9,138	11,883
230.....	8,783	10,797	12,925	14,227	13,181
250.....	15,098	16,601	17,456	19,274	14,998
280.....	10,422	10,015	10,684	11,202	10,603
310.....	20,364	16,620	18,183	21,879	21,288
320.....	14,578	13,390	14,769	17,088	15,930
330.....	14,196	14,050	14,987	15,753	16,064
340.....	15,643	13,209	16,444	20,217	19,398
350.....	17,415	14,323	19,323	24,960	24,442
360 ¹	16,504	15,139	7,230	(¹)	(¹)
Corps.....	227,388	222,333	237,237	267,362	249,435

¹ Group 360 was abolished in March 1970.

NUMBER OF APPEALS TAKEN BY GROUP

[Fiscal years 1968-1972]

Group	1968	1969	1970	1971	1972
110.....	926	827	1,002	994	1,100
120.....	1,294	1,321	1,719	1,313	1,483
140.....	1,226	1,383	1,526	1,487	1,431
160.....	659	759	1,029	957	831
170.....	596	647	652	676	764
210.....	179	219	298	263	269
220.....	207	223	133	169	245
230.....	153	174	301	323	304
250.....	307	428	562	500	460
280.....	166	169	228	239	152
310.....	273	275	244	324	266
320.....	174	171	213	224	280
330.....	244	266	326	282	297
340.....	220	196	202	337	236
350.....	251	275	302	420	438
360 ¹	308	312	231	(1)	(1)
Corps.....	7,183	7,645	8,968	8,508	8,556

¹ Group 360 was abolished in March 1970.

In regard to the number of appeals taken by group, this information, standing alone, might well be misleading since more than half of the appeals taken are either withdrawn or dismissed. Many appeals are filed merely to gain time for further deliberation either by the applicant himself or in consultation with the examiner, for the purpose of attempting to resolve any remaining issues.

NUMBER OF PATENTS ISSUED BY GROUP

[Fiscal years 1968-1972]

Group	1968	1969	1970	1971	1972
110.....	4,521	4,528	4,167	4,040	4,088
120.....	4,509	4,489	4,745	4,623	4,690
140.....	3,926	3,473	3,255	3,192	2,713
160.....	2,982	3,025	3,425	3,945	3,422
170.....	3,318	3,468	3,261	3,356	3,040
210.....	4,311	4,461	4,571	4,535	4,120
220.....	2,154	1,969	1,894	2,474	2,511
230.....	2,966	3,462	4,007	4,274	4,135
250.....	4,835	5,181	5,623	5,444	4,417
280.....	3,574	3,563	3,671	3,697	3,556
310.....	7,991	6,815	6,324	7,205	6,853
320.....	5,739	5,490	5,528	6,005	5,588
330.....	4,283	4,349	4,407	4,489	4,427
340.....	6,270	5,187	5,901	6,953	6,352
350.....	6,434	5,280	6,788	7,938	7,739
360.....	6,033	5,741	2,561	(1)	(1)
Corps.....	73,846	70,481	70,129	72,170	67,651

¹ Group 360 was abolished in March 1970.

PATENT OFFICE REPLY TO SENATOR HART'S LETTER OF MARCH 19, 1973

Appendix B1

CHART B1—U.S. PATENTS BY UNITED STATES AND FOREIGN APPLICANTS

Introduction

Your letter further states that:

"It would also be helpful to have whatever information the Patent Office has on the ownership and origin of patent applications and issued patents for the past ten years. This should include statistics of domestic and foreign ownership (by country and industry), corporate and individual ownership (by industry), assignments to governments or corporations, and any other data available to the Patent Office concerning the source and ownership of both patents and applications."

In response thereto, there is attached, in the form of four charts (Appendices B1-B4) the information that the Patent Office presently has available which could be produced in a reasonable period of time. The charts provide the following information:

CHART B1—U.S. PATENTS BY UNITED STATES AND FOREIGN APPLICANTS

This chart provides, for a ten-year period, a breakdown of the number of U.S. patents issued, arranged by residence of the applicants, U.S. or foreign, with all foreign countries considered together. The chart also identifies the number of patents issued without assignment, and therefore presumed to be issued to the individual inventor, and the number issued with assignments to other individuals, to corporations, or to governments. Also indicated, where assignments have been made, is the nationality, U.S. or foreign, of the assignee (owner). The information regarding assignments would include any assignment made up to the time of the issuance of the patent, but not assignments made after the patent has issued.

CHART B1.—U.S. ISSUED PATENTS BY UNITED STATES AND FOREIGN ORIGIN OF APPLICANT

Year of issuance	Total patents issued	Issued to U.S. applicants						Issued to foreign applicants											
		Assigned to						Assigned to											
		Individual			Corporation			Government			Individual			Corporation			Government		
		Without assign- ment ¹	United States	Foreign	United States	Foreign	Government	Without assign- ment ¹	United States	Foreign	United States	Foreign	Government						
1963	45,681	37,176	9,536	826	1	25,720	75	1,017	1	1	8,505	1,952	35	177	912	5,293	4	132	
1964	47,396	38,410	9,517	835	5	26,802	77	1,173	1	1	8,966	1,950	42	155	1,034	5,630	9	146	
1965	62,857	50,332	12,059	974	5	35,697	75	1,522	75	1,522	12,525	2,761	32	232	1,461	7,811	18	210	
1966	68,406	54,634	12,087	969	8	39,884	161	1,513	12	12	13,772	2,695	38	221	1,750	8,808	19	241	
1967	65,652	51,274	11,763	871	8	36,745	157	1,726	4	4	14,378	2,784	37	184	1,608	9,454	31	280	
1968	59,102	45,782	10,045	722	5	33,350	200	1,459	1	1	13,320	2,601	30	152	1,536	8,837	30	134	
1969	67,557	50,395	10,664	765	3	37,064	190	1,705	4	4	17,162	3,125	53	162	1,783	11,739	45	255	
1970	64,427	47,073	9,590	591	7	34,922	247	1,709	7	7	17,354	3,163	44	116	1,974	11,826	17	214	
1971	78,316	55,988	12,110	724	13	40,805	414	1,920	2	2	22,328	0,074	130	248	2,217	15,566	27	66	
1972	74,808	51,515	12,089	581	11	36,908	300	1,623	3	3	23,293	4,934	66	179	1,982	16,075	21	36	

¹Patents issued without assignment are presumed to be issued to the independent inventor.

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Appendix B2

CHART B2—U.S. PATENTS BY UNITED STATES AND FOREIGN OWNERSHIP

Introduction

This chart provides the same type of information as set forth in Chart B1 except that U.S. and foreign ownership is indicated by ownership by individuals (including the individual inventor and individual assignee), corporations, and governments. Again, all foreign countries are considered together.

CHART B2.—U.S. ISSUED PATENTS BY UNITED STATES AND FOREIGN OWNERSHIP

Year of issuance	Total patents issued	U.S. ownership				Foreign ownership			
		Total	Individuals	Corporations	Governments	Total	Individuals	Corporations	Governments
1963.....	45,681	38,050	10,397	26,632	1,021	7,631	2,130	5,368	133
1964.....	47,376	39,412	10,394	27,836	1,182	7,964	2,110	5,707	147
1965.....	62,857	51,763	13,065	37,158	1,540	11,094	2,998	7,886	210
1966.....	68,406	56,260	13,094	41,634	1,532	12,146	2,924	8,969	253
1967.....	65,652	52,781	12,671	38,353	1,757	12,871	2,976	9,611	284
1968.....	59,102	47,172	10,797	34,886	1,489	11,930	2,758	9,037	135
1969.....	67,557	52,079	11,482	38,847	1,750	15,478	3,290	11,929	259
1970.....	64,427	48,847	10,225	36,896	1,726	15,580	3,286	12,073	221
1971.....	78,316	57,933	12,964	43,022	1,947	20,383	4,335	15,980	68
1972.....	74,808	53,270	12,736	38,890	1,644	21,538	5,124	16,635	39

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Appendix B3

CHART B3—U.S. PATENTS BY COUNTRY OF APPLICANT

Introduction

This chart shows the numbers of U.S. patents issued over a ten-year period, arranged according to country of residence of the applicants.

CHART B3.—U.S. ISSUED PATENTS BY COUNTRY OF APPLICANT

Country	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
United States.....	37,176	38,410	50,332	54,634	51,274	45,782	50,395	47,073	55,988	51,515
Algeria.....	3		2			1		1		1
Argentina.....	19	27	18	20	16	18	17	24	22	29
Australia.....	69	80	110	110	151	119	155	143	200	182
Austria.....	86	91	143	128	151	160	191	191	250	271
Belgium.....	85	131	184	185	176	169	220	233	305	319
Bermuda.....	3	2	3	2	1		3	2	4	6
Bolivia.....					1	1	2	8	6	6
Brazil.....	17	10	11	17	12	13	18	16	14	16
British West Indies.....	5	8	3	1	4	4	9	1	12	4
Bulgaria.....		1	1		5	1	7	9	11	10
Cameroon.....				1						1
Canada.....	606	648	853	938	991	897	994	1,065	1,327	1,244
Ceylon.....	1						1			
Chile.....	1	1	3	1	3	2	8	2	8	4
China, Republic of.....	4	3	4	2	9	5	5	6	15	8
Colombia.....	2	3	5	8	4	2	5	6	7	8
Congo (Brazzaville).....		3						2		
Costa Rica.....	1		2		2		1		2	
Cuba.....	8	1	1					1	2	1
Cyprus.....						1		1		
Czechoslovakia.....	44	34	52	38	96	96	132	118	154	110
Dahomey.....								1		
Denmark.....	70	63	88	101	123	82	144	138	169	173
Dominican Republic.....		2	1							1
Ecuador.....	1			2	2		4	2	3	2
Egypt.....										3
El Salvador.....	1		1	1	4	2	3	1	1	
Ethiopia.....								1		
Finland.....	18	9	22	27	34	31	43	46	59	69
France.....	854	1,013	1,372	1,436	1,558	1,446	1,808	1,732	2,214	2,231
Germany, Federal Republic of.....	2,338	2,420	3,388	3,981	3,766	3,442	4,523	4,434	5,521	5,728
Greece.....	7	1	5	5	13	3	11	8	6	16

CHART B3.—U.S. ISSUED PATENTS BY COUNTRY OF APPLICANT—Continued

Country	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Guatemala	2			5	5		4	2	3	
Haiti				2	2	2	2	1	3	
Honduras				1		1	5	3	1	1
Hong Kong	6	5	6	8	12	7	7	8	20	7
Hungary	13	20	20	31	23	21	22	37	38	48
Iceland		2	3	2	1	4	1	7	9	7
India	4	7	8	5	10	15	18	16	10	19
Indonesia	1			5	12	25		1	2	2
Iran	1	1	1	2	3	1	1	4	3	3
Ireland	1	10	5	9	8	10	13	12	29	18
Israel	20	26	33	45	53	38	61	46	54	54
Italy	345	308	414	429	471	477	556	572	726	838
Jamaica					1	1				4
Japan	407	545	919	1,122	1,424	1,464	2,152	2,625	4,033	5,154
Jordan										1
Kenya		3		2	1	2	1	4	1	
Korea		3	2	2		2		3	2	7
Kuwait							1			
Lebanon	4			1		3	2	1	4	1
Liberia						1				
Libya	1		1							1
Liechtenstein	5	10	14	12	13	15	14	23	28	10
Luxembourg	5	4	3	6	7	7	2	1	5	8
Madagascar								1		
Malaysia	1		2	2				1		
Mauritania								1		
Mexico	92	72	87	99	43	40	68	43	64	42
Monaco	1	2	2	6	3	4	4	2	4	2
Morocco	3	3	6	6	3	4	1	2		3
Netherlands	329	356	519	482	507	476	558	543	695	676
New Zealand	12	12	17	10	15	13	16	14	17	26
Nicaragua				2	4	2	2	1	2	2
Nigeria					2	2	1	1	4	
Norway	33	43	52	59	49	49	69	68	77	88
Pakistan	2		1	2	2		1	1		
Panama	2	2	1	1				1	1	4
Paraguay										1
Peru	1	5	5	2	5	5	5	6	3	4
Philippines, Republic of	7	5	2	4	1	2	4	2	5	11
Poland	3	1	9	10	12	25	31	33	31	21
Portugal	3	2	2	4	1	7	6	3	7	7
Rhodesia	5	3	4	2	2		3		5	1
Rumania	2	2	2	4	6	21	21	37	35	33
Saudi Arabia		1		1		1		3	1	2
Senegal	1									
Singapore					1	1	2		4	4
South Africa, Republic of	30	34	69	48	52	35	65	49	69	53
Southwest Africa								1	2	
Spain	26	19	49	50	46	48	59	57	74	60
Sudan						2		2	1	1
Sweden	386	368	562	537	574	569	673	627	843	775
Switzerland	668	657	862	983	948	822	1,058	1,112	1,281	1,305
Syria										1
Tanzania							3		3	1
Thailand									1	1
Trinidad & Tobago		1		2		1	1	2	3	3
Tunisia	1		1		1					1
Turkey		2		2	4	3	1		3	3
Uganda				1		1				
Union of Soviet Socialist Republics	15	12	28	66	115	95	159	218	326	355
United Arab Republic		1	1	3	4	1			4	
United Kingdom	1,810	1,839	2,574	2,677	2,799	2,481	3,175	2,952	3,456	3,164
Uruguay	3	3	3	3	1	1		1	2	
Venezuela	9	12	11	7	5	13	6	3	13	7
Vietnam (South)							1		1	2
Yugoslavia	2	4	3	4	4	4	3	6	9	6
Zambia				1	1			2	1	2

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Appendix B4

CHART B4.—U.S. APPLICATIONS FILED BY COUNTRY OF APPLICANT

Introduction

This chart shows the number of U.S. patent applications filed over a ten-year period by U.S. and foreign applicants, arranged by country of residence of the applicants.

CHART B4.—U.S. APPLICATIONS FILED BY COUNTRY OF APPLICANT

Country	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
United States.....	67,038	66,824	67,190	72,577	66,863	64,118	67,180	68,243	72,343	71,089
Algeria.....					1			2		1
Argentina.....	61	79	61	53	40	35	45	41	52	49
Australia.....	191	204	194	225	220	263	313	308	293	324
Austria.....	202	206	195	229	232	273	286	337	333	369
Belgium.....	271	260	250	286	303	319	384	377	330	387
Bermuda.....	1	3		2			2	1	1	2
Bolivia.....			3	1	2	1	1	1	1	
Brazil.....	40	30	13	33	35	30	29	22	30	51
British West Indies.....	3	5	8	2		6	3	9	14	1
Bulgaria.....	2	1	1	7	7	11	10	27	16	20
Burma.....	2									
Cameroon.....								1		
Canada.....	1,641	1,574	1,595	1,695	1,323	1,456	1,558	1,707	1,843	2,025
Ceylon.....	1				1					
Chile.....	5	5	7	5	13	7	6	16	6	9
China, Republic of.....	5	3	8	8	16	13	3	19	27	28
Colombia.....	8	3	6	5	6	6	1	9	4	
Congo (Brazzaville).....								1		
Costa Rica.....	3	3		1	1	2	1	2		
Cuba.....								1	2	
Cyprus.....				1						
Czechoslovakia.....	68	66	113	186	186	160	174	218	134	166
Denmark.....	273	129	175	165	172	168	195	221	211	275
Dominican Republic.....	1	2								
Ecuador.....	2		3					1		
Egypt.....	2									
El Salvador.....		2	2			5		3		
Ethiopia.....	1				1			2	1	
Finland.....	40	32	41	44	52	73	94	103	125	154
France.....	1,831	1,874	2,084	2,246	2,174	2,385	2,522	2,821	2,625	2,987
Germany, Federal Republic of.....	4,608	4,635	4,983	5,731	5,504	5,734	6,455	7,405	7,798	7,772
Greece.....	9	7	14	14	14	9	19	17	16	15
Guatemala.....		5		5	1	1		2	2	1
Haiti.....		1	1		2	2	1	1		
Honduras.....			1		4				2	
Hong Kong.....	8	7	13	9	15	7		24	23	25
Hungary.....	39	33	31	37	48	66	54	70	80	88
Iceland.....		2		1	7	2		4	2	
India.....	10	14	11	10	25	32	13	30	21	22
Indonesia.....	1			1	1			3		1
Iran.....	2	3			2	4		4	1	4
Ireland.....	1	1			30	27	29	44	44	33
Israel.....	70	83	69	94	86	64	73	87	90	120
Italy.....	744	794	718	811	849	866	960	1,031	1,105	1,160
Jamaica.....					2	4	4	4	1	
Japan.....	1,281	1,943	2,147	2,263	2,479	3,354	4,051	5,430	6,093	7,418
Jordan.....							1	1	1	
Kenya.....		2	1		1	4		1	2	
Korea.....	1	3	2	1	5	2	4	11	13	4
Kuwait.....	1							1		
Lebanon.....	1		1		6	3		6		2
Liberia.....				1				2		
Libya.....									5	
Liechtenstein.....	6	15	25	24	18	13	13	27	25	23
Luxembourg.....	5	4	1	7	5			14	16	11
Malaysia.....	2		1			2			2	1
Mali.....					2			1		
Malta.....									1	
Mexico.....	164	225	136	83	97	78	177	74	73	87
Monaco.....	3	7	6	3	5	2	1	7	2	
Morocco.....	5	3	3	5	4	1			1	
Netherlands.....	603	599	713	690	652	711	790	899	866	1,017
New Zealand.....	19	16	30	27	20	22	22	34	38	54
Nicaragua.....			2	2	1				2	
Nigeria.....	1	2		1	1	1		2		
Norway.....	75	92	90	96	63	90	95	107	130	146
Pakistan.....	2		2	2	1		1		2	
Panama.....	1			1	1			4	4	
Paraguay.....								2	1	
Peru.....	8	7	8	16	4	7	7	7	4	5
Philippines.....	5	6	1	2	12	4	9	13	17	12
Poland.....	21	12	31	27	50	48	55	59	45	51
Portugal.....	1		4	18	11	12	15	13	10	9
Rhodesia and Nyasaland.....	3	3	5	1	3	3	1	2	4	
Rumania.....		7	12	15	15	45	53	59	45	53
Saudi Arabia.....		1			3	4	1	5		
Senegal.....								5		
Singapore.....	2	1			4			2		5
South Africa, Republic of.....	89	108	95	99	83	101	102	115	98	149
Spain.....	82	91	84	93	116	106	133	145	123	156
Sudan.....				1				2		

CHART B₄—U.S. APPLICATIONS FILED BY COUNTRY OF APPLICANT—Continued

Country	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Sweden.....	643	658	726	833	858	825	941	1,070	957	1,148
Switzerland.....	1,304	1,243	1,341	1,377	1,399	1,513	1,551	1,698	1,770	1,848
Tanzania.....								17	1	
Thailand.....				1			1	3		14
Trinidad & Tobago.....								1		2
Turkey.....	1		3	5	1	3	1	6	5	3
Uganda.....								2	1	
Union of Soviet Socialist Republics.....	14	134	262	215	112	427	329	438	445	578
United Arab Republic.....		1	1	3			17			1
United Kingdom.....	3,755	3,871	4,241	4,481	4,238	4,597	4,660	5,216	4,746	4,734
Uruguay.....	5	5		1		2	1	7	3	5
Venezuela.....	21	13	12	12	15	9	6	14	11	5
Vietnam (South).....				1	1		1			
Yugoslavia.....	4	13	7	10	7	17	17	12	14	10
Zambia.....								3	3	

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APPENDIX C

C. PATENT LITIGATION IN THE FEDERAL COURTS

The last paragraph of page 3 of your letter is a request for a summary of the past five years of:

(A) patent litigation in the Federal courts, both at the District Court and Appellate level, including: (1) The number and identification of cases and patents litigated; (2) the holdings and rate of patent validity and invalidity, infringement, misuse, and fraud or inequitable behavior (and the specific grounds therefor); and,

(B) with respect to the above patents, review during patent prosecution, before (1) the Board of Appeals; (2) the Board of Patent Interferences; (3) the CCPA; and (4) others.

In accordance with your comment, the *Patent Office* extracted the information contained herein from the compiled notices filed in the Patent Office under the provisions of 35 U.S.C. 290. The information so obtained was cross-checked for accuracy and completeness against the reported decisions in the United States Patents Quarterly and a computer printout showing those recent U.S. patents in which (during their Patent Office prosecution) decisions were rendered by the Board of Appeals and/or by the Board of Patent Interferences. This tabulation forms Appendix C.

A complete answer to your request in (B), *supra*, would dictate an inspection of each patented file. However, since such an undertaking would be impossible within the time allotted, no attempt was made to provide complete information on each litigated patent as to prior review within the Patent Office, or by its reviewing courts, before its issuance.

The results of the study are set forth in the accompanying table.

	Design			Reissue			Plant			Utility			Total		
	CA	Dct	CtCl	CA	Dct	CtCl	CA	Dct	CtCl	CA	Dct	CtCl	CA	Dct	CtCl
Number of patents including an indication of validity, invalidity, or infringement.....	8	50	0	11	24	2	0	1	0	256	611	25	275	696	27
Total.....		58			37			1			892			988	
Patents held valid.....	0	17	0	2	4	1	0	0	0	78	246	17	80	267	18
Total.....		17			7			0			341			365	
Patents held invalid.....	8	9	0	7	15	1	0	0	0	167	137	8	182	161	9
Total.....		17			23			0			312			352	
Rate invalidity/valid+invalid (percent).....	100	34.6	0	78	79	50	0	0	0	68.2	35.8	32	69.5	37.6	33.3
Total percent invalid/valid+invalid.....		50			76			0			48			49	
Infringed.....	0	45	0	3	6	1	0	1	0	67	504	17	70	556	18
Total.....		45			10			1			588			644	
Fraud.....	0	0	0	1	2	0	0	0	0	6	13	0	7	15	0
Total.....		0			3			0			19			22	
Misuses.....	0	0	0	1	0	0	0	0	0	6	7	0	7	7	0
Total.....		0			1			0			13			14	

Explanatory remarks

In the interest of clarity and elimination of any misconception as to the meaning and interpretation of the statistics tabulated above, the following explanation is offered.

Number of cases

The number of individual cases with a holding (dismissed, valid, injunction, etc.) during the period from January 1, 1968 to December 31, 1972, was found to be approximately 2,000. Although the actual figure was determined to be slightly in excess of 2,000, a recognition of the opportunity for mistake, taken with a potential high percentage of error, discussed *infra*, renders any more specific number statistically meaningless.

Number of patents

The number of individual patents litigated during the five-year period, in which the suit was terminated by dismissal, consent judgment, summary judgment, or holdings of validity, invalidity, injunction, etc., was found to be approximately 2025. Of those, the number of patents in which there was a judgment of validity, invalidity or infringement totalled 988.

For reference purposes, it is noted that during this five-year period, the Patent Office issues approximately 360,000 patents. The percentage of patents litigated with respect to the total number of patents issued over this five-year period is 0.56%. Further, the number of patents issued by the Patent Office covering the time span from the earliest reported litigated patent included in this study (#2,126,786) to the latest reported litigated patent indicated in the study (#3,678,148) is approximately 1,550,000. The percentage of patents litigated with respect to this number is 0.13%.

Patents held valid or invalid

Validity statistics may vary. They may be (a) inclusive of each individual court holding of validity or invalidity, (b) limited to holdings within each of the judicial circuits, (c) restricted to a single holding representing the final adjudication of the patent's validity, or (d) directed only to the decisions of the appellate courts.

In this study, the validity or invalidity of a given patent has been determined by tabulating the result or decision of the highest court in which the litigation was conducted and such holdings were made. Where two or more courts concurred in holding the same patent valid or invalid, that patent was counted as valid or invalid only once. In the rare instances where conflicting decisions on validity by coordinate tribunals have occurred, the patent was counted as invalid. It was noted that many court opinions and §290 notices did not point out whether all, or only some, of the claims of a patent were held valid or invalid. Where a court did explicitly hold some claims valid and other claims invalid, the patent was counted as valid, inasmuch as the patent remains in force with valid claims therein. A consent judgment of validity or invalidity, where denominated as such in the §290 notice, was counted as a holding of validity or invalidity. However, infringement and injunction holdings, without any mention of validity, were *not* presumed to be findings of validity.

Rate of patent invalidity

The term "rate of patent invalidity" appears to have no recognized definite meaning. Such rate may be calculated as a percentage of total patents litigated or only as a percentage of those litigated patents having a holding of validity or invalidity. The latter base has been employed in this study.

It is to be stressed that there is no evident link between the characteristics of the litigated patents which caused them to be litigated and the characteristics of the remaining unlitigated patents which would justify the conclusion that the rate of invalidity noted above can be extrapolated to, or is in anyway representative of, the total patent universe.

Infringement

Instances of infringement are not always indicated in the report of the courts' decisions. Often there is no explicit holding that a claim is infringed, although such conclusion would be implicit because the court enjoined the defendant from making, using or selling certain devices. Accordingly, in the

absence of any countervailing information, an injunction has been counted as a holding of infringement for statistical purposes.

Misuse, fraud, and inequitable conduct

The term "misuse" has been used in most instances to describe the unlawful extension of the patent rights, either beyond the seventeen-year grant or to non-patented articles. However, fraud and inequitable conduct embrace a multitude of various acts, before and/or after issuance of the patent. Therefore, it should be observed that the figures reported herein do not represent instances of "fraud" in the technical sense, but include conduct that may loosely be classified as inequitable. Instances are relatively few, but so varied and lengthy in explanation, that mere notation has been made of their occurrence. A significant number of cases were found where the issue of fraud, misuse, or inequitable conduct was raised by an alleged infringer, but not found by the court.

Summary

The Patent Office views this study as far more comprehensive and accurate—particularly for the time span considered—than any studies heretofore undertaken which have examined merely, for the most part, reported decisions of the Courts of Appeals. Those previous studies are included as a bibliography to this study.

It is to be noted that the percentage of litigated patents held invalid by the Courts of Appeals (69%) in the five-year period 1968–1972 covered by this study corresponds closely to the invalidity percentages found by the other authors mentioned in the bibliography for the period 1940–1972. However, the inclusion in this study of unappealed and unreported judgments of the District Courts to obtain a resultant total rate of patent validity of approximately 50% places the entire litigated patent validity/invalidity picture in proper perspective.

Nevertheless, candor compels stating that certain inadequacies in the information available from the §290 notices could result in potentially erroneous statistics even in this study. In that connection, it was found that the notices submitted under 35 U.S.C. 290 had the following defects: (1) Notices were not filed in every case; (2) when filed, the notices were not necessarily submitted promptly; and (3) the data in the notices was incomplete and, in many instances, incorrect. For example, mere notations of dismissal, which were often indiscriminately employed in the §290 notices, were found to stand for holdings of validity or invalidity upon comparison with any reported decisions corresponding to those §290 notices.

Additionally, it may be noted that a summary limited to a "five-year" period involves certain features that give an incorrect impression. Thus, aside from the obvious effects of subsequent appeals, a dismissal in one suit (within the five-year period) subsequent to, or prior to, a final adjudication of the same patent's validity, or invalidity, in another suit (outside the five-year period) has significance different from that of a dismissal in the absence of any other decision. In other words, the complete history of the patent is necessary to a proper appreciation of the patent's validity or invalidity.

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- (2) Federico, "Adjudicated Patents 1948–54", 38 JPOS 233, 244, reported on adjudications from 1925–54.
- (3) Gausewitz, "Brief in Support of Proposed Amendment to Section 103, Title 35, Patents, U.S. Code," 51 JPOS 290 (May 1969).
- (4) Horn et al., "The Federal Courts' View of Patents—A Different View," 55 JPOS 134 (March 1973) studied 597 adjudicated patents from January 1961 through December 1970.
- (5) Koenig, dissertation submitted in partial fulfillment of requirements for S. J. D. degree, New York University Law School, December 1971. She studied adjudications of 854 patents from 1953–67.
- (6) Moxon, "Patent Invalidity Study", unpublished, January 17, 1973, examined 284 adjudicated patents in the period 1967–71.

- (7) Senate Report No. 167, 90th Congress, 1st Session examined validity of 46 patents before *Graham v. John Deere*, 383 U.S. 1 (1966) and 38 patents subsequent to *Graham*.
- (8) Tegtmeyer, "For Greater Patent Validity," American University Law Review, Vol. 19, No. 1 (December 1969) studied 869 adjudicated patents from 1953-68.

In the interest of economy of space, the following abbreviations have been employed in the summary where applicable:

B of A—Board of Appeals	Inj—injunction
B of I—Board of Patent Interferences	J—Judgment
CCPA—Court of Customs & Patent Appeals	M—Misuse of patent
c.e.—collateral estoppel	misrep. of art—misrepresentation of the state of the art
CJ—Consent Judgment	NI—not infringed
d—docket number	NV—not valid (invalid)
D or def.—defendant	P—plaintiff
Dm—dismissal	SJ—summary judgment
F—fraud and inequitable conduct	w/p—with prejudice
I—infringed	wo/p—without prejudice
	V—valid

Patent No.	Case	Citation	Decision	Date	Litigation in Patent Office
Plant 1,141	John M. Garabedian v. Vaughn Girazian et al.	843 O.G. 18 877 O.G. 11	Dm.-----	May 18, 1970	
Plant 1,882	Neva Kazarian et al. v. H. T. Kobashi	866 O.G. 699 873 O.G. 15	Inj.-----	Dec. 30, 1969	
D171,963	Blumcraft et al. v. Architectural Mtg. Inc. et al.	172PQ460	SJ, c.e. NV. --	Jan. 7, 1972	
	Blumcraft et al. v. Architectural Mtg. Inc. et al.	174PQ384 CA10	SJ, c.e. NV Aff.	May 24, 1972	
	Blumcraft of Pitts. v. Citiz. & Southern Nat. Bank of S.C.	158PQ642	V, I-----	May 28, 1968	
	Blumcraft of Pitts. v. Citiz. & Southern Nat. Bank of S.C.	160PQ642 CA4	NV Rev.-----	Feb. 19, 1969	
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D172,414	Adell Mfg. et al. v. Victra Sales	d30272 E.D. Mich.	CJ, Inj.-----	May 14, 1971	
D172,494	American Type Founders, Inc. v. Prestype Inc.	d68Civ2460 S.D. N.Y.	DM.-----	Dec. 29, 1969	
D173,177	Laura B. Wright v. J. C. Penney Co.	dA-120-68Civ D Alaska	DM.-----	Mar. 24, 1969	
D176,492	Barofsky v. Gen. Electric	158PQ178CA9	NV Aff.-----	May 20, 1968	
D179,591	Clarence E. Clark v. Castle Sporting Goods Inc. et al.	d67C216 N.D. Ill.	DM.-----	Apr. 27, 1969	
D182,556	Walter Kiddes & Co., Inc. v. Leland Industries, Inc. et al.	d670-66 D N.J.	DM.-----	Aug. 11, 1969	
D184, 163	Bloomfield Industries, Inc. v. Wesco Spring Co., Inc.	d68C2253 N.D. Ill.	DM.-----	Apr. 8, 1969	
D184, 542	Swank, Inc. v. Sheffield Watch Corp. et al.	d67Civ2221 S.D. N.Y.	DM.-----	Dec. 16, 1969	
D184, 739	Kanter v. Colgate-Palmolive	d542-70-4 E.D. Va.	DM.-----	Apr. 22, 1971	
D186, 358	Trimble Products Inc. v. W. T. Grant Co.	159PQ92	NV.-----	Mar. 21, 1968	
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D187,272	Flex Rite Corp. v. Hurricane Auto Prod.	d4220 W.D. Wash.	I.-----	Feb. 3, 1971	
D188, 460	Clear Beam Antenna Corp. v. JFD Electronics.	d68C470 S.D. N.Y.	DM.-----	June 15, 1971	
D189, 914	Jetronic Ind. v. Raytheon	d3406 D. Del.	DM.-----	Apr. 2, 1971	
D189, 343	L. F. Strassheim Co. v. Gold Medel Folding Furniture Co.	161PQ692	V, I.-----	June 18, 1968	
D191, 144	Lewis Co. v. Gould Products, Inc. et al.	160PQ311	NV, NI.-----	Mar. 23, 1972	
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D194, 094	Frantz Mfg. Co. v. Phenix Mfg. Co.	173PQ266 CA7	NV Rev.	Mar. 16, 1972	B of A.
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D195, 420	Rival Mfg. Co. v. Van Wyck Int'l Corp.	d66Civ3079 S.D. N.Y.	CJ, INJ.	May 16, 1969	
D195, 603	Polytop Corp. v. U.S. Cap & Closure, Inc.	D67C1586 N.D. Ill.	DM	June 12, 1968	
D196, 883	St. Regis Paper Co. v. Container Corp. of America.	d68Civ1958 S.D. N.Y.	DM	Sept. 19, 1969	
D197, 670	Seeburg Corp v. Taran Enterprises, Inc.	d67-1058Civ S.D. Fla.	I	May 12, 1969	
D197, 836	Hancock Gross Inc. v. Scully Rubber Mfg. Co.	d21456 D. Md.	DM	Feb. 27, 1970	
D199, 143	Hadco Products, Inc. v. Lighting Corp. of America.	165PQ496	V, I	Apr. 2, 1970	
	Hadco Products, Inc. v. Frank Dini Co., Inc.	159PQ321 CA3	NI Aff.	Oct. 10, 1968	
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D199, 420	GAF Corp. v. Berkey Photo, et al.	d68C2345 N.D. Ind.	DM	Sept. 20, 1971	
D199, 590	Flexible Plastics Corp. v. Black Mountain Spring Water, Inc.	176PQ227	NV	Aug. 10, 1972	
D200, 160	Storm Man Co. v. Looboy, Inc.	D68-309Civ W.D. Okla.	INJ.	Oct. 8, 1970	
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	John K. Rains v. Cascade Industries, Inc.	d976-66 C.D.N.J.	DM	Feb. 26, 1969	
	John K. Rains v. Hendon Construction Co.	dC813-66 D.N.J.	DM	Sep. 26, 1969	
	John K. Rains v. Alistate Decorators Inc.	d66Civ811 S.D.N.Y.	DM	May 13, 1969	
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D203, 608	Diversified Prod. Corp et al v. Sports Stores Inc. et al.	160PQ458	NV	Dec. 31, 1968	
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D204, 995	Sperry Rand Corp. v. Oliver Corp.	d69C547 N.D. Ia	DM	June 15, 1971	
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D205, 459	Kenner Prod. v. Bross et al.	d1728-70 D. N.J.	DM	Mar. 26, 1971	
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D206,486	Storm Man. Co. v. Looboyale, Inc.	d68-309Civ W.D. Okla.	INJ	Oct. 8, 1970	
D206,662	AMP Inc. v. Virginia Panel Corp.	d69C27-H W.D. Va.	I, INJ	Feb. 26, 1970	
D207,047	Pilot Research Corp. v. S. Klein Dept Stores, Inc.	d68Civ3015 S.D. N.Y.	DM	Aug. 6, 1969	
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D207,342	Robertshaw Controls Co. v. Honeywell, Inc.	d68-1132S C.D. Calif.	DM	July 3, 1969	
D207,644	Matyas v. Great Lakes Hardware	d30178E D. Mich.	CJ, INJ	May 28, 1968	
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D208,350	Tenex Corp. v. Den. Felt & Carlyle Vinyl Products.	d67Civ1578 N.D. Ill.	DM	Mar. 19, 1968	
D208,474	Coastal Dynamics v. Symbolic Displays.	175PQ81 CA9	NV Aff	Aug. 4, 1972	
D208,501	Seeburg Corp. v. Taran Enterprises, Elpo Ind., Inc. v. Chadwick-Miller Inc.	d67-1058 S.D. Fla. d67Civ5019S.D.N.Y.	I I	May 12, 1969 Mar. 31, 1970	
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D209,499	Ames Shower Curtain Co. v. Heinz Nathanson.	158PQ549	I	June 4, 1968	
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D210,015	George Saltzman et ano, v. Samuel Bitran.	d68Civ2290 S.D.N.Y.	INJ	Oct. 2, 1968	
D210,052	Fedtuo, Inc. v. Spencer Gifts et al.	d341-68 D.N.J.	DM	Apr. 28, 1972	
D210,129	Perfect Film & Chemical Corp. v. Aimes Engr. Co. Inc.	d68Civ2272 N.D. Ill.	DM	Jan. 31, 1969	
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D210,842	Kustom Electronics, Inc. v. Southeast Tech. Enterprises Inc.	d69-19 M.D. Fla.	DM	Sept. 22, 1969	
D210,922	John Thomas Batts Inc. v. Mr. Hanger Child Guidance Toys, Inc. v. R. H. Macy & Co. Inc.	176PQ388 d68Civ3831 S.D.N.Y.	NV DM	June 14, 1972 July 19, 1972	
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D211,358	Maxwell Royal Chair v. Clayton Marcus.	d2391 W.D.N.C.	CJ, V, INJ	Jan. 6, 1971	
D211,602	Kustom Electronics Inc. et al. v. Maurice Lipsky Music Co., Inc.	d69Civ164 S.D.N.Y.	DM	Feb. 10, 1970	
D211,633	Maytag Co. v. Hoover Co.	d70C2946 N.D. Ia	DM	Oct. 12, 1971	
D211,785	Maxwell Royal Chair v. Clayton Marcus.	d2391 W.D.N.C.	CJ, V, INJ	Jan. 6, 1971	
D212,011	Lewis Risom Design v. John E. Sjostrom Co.	d70-C127J E.D.N.Y.	DM	Mar. 8, 1971	
D212,261	Ritchard Salvage v. Magesco Trading Corp.	d68Civ4910 S.D.N.Y.	DM	Mar. 20, 1970	
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D212,826	Alprod Corp. v. Southeastern Plastics Corp.	d2475 W.D.N.C.	DM	Dec. 21, 1971	
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D212,882	Intertech Enterprises, Ltd. v. Atmos Tech. Corp.	dC1307-68 D.N.J.	V, I, INJ	Dec. 11, 1969	
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D213, 609	Ellis Associates, Inc. v. Lilli Ann Corp.	d69-1683 S.D.N.Y.	DM	June 22, 1972	
D213, 643	Stanley Worth v. Oxwall Tool Co.	d72C438 E.D.N.Y.	CJ	Aug. 17, 1972	
D214, 096	Seeburg Corp. of Delaware v. Specialty Sales Corp. of America.	d69C1008 N.D. Ill.	CJ, V, I, INJ	Sept. 16, 1969	
D215, 640	Popeil Bros., Inc. v. Nathan K. Morris, W. T. Grant Co.	176PQ353	NV	Dec. 29, 1972	
D216, 486	Bandwagon, Inc. v. Kalimar Inc.	d70C134(1) E.D. Mo.	DM, INJ	Sept. 15, 1970	
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D221, 219	Futorian Corp v. Fitchman Associates, Inc.	d71C2049 N.D. Ia	V, I, INJ	Oct. 15, 1971	
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Re 24, 879	Caldwell v. U.S.	175PQ44 Court of Claims	NV	July 24, 1972	
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Re 24,954	Aerodyne Machine v. Slick Industrial Co.	169PQ150 D. Minn.	NV	Feb. 23, 1971	
Re 24,955	Allstate-Campbell Inc. v. Joseph S. Leader et al.	d4-67C24 D. Minn.	DM without prej.	Feb. 9, 1968	
Re 24,968	Sonotone Corp. v. Rivertone Co. Inc.	d68Civ3963 S.D. N.Y.	DM with prej.	Jan. 7, 1970	
Re 24,992	St. Regis Paper Co. v. Tee-Pack Inc.	176PQ259 N.D. Ohio	NV	Dec. 22, 1972	
Re 25,011	SCM Corp. v. Nippo Machine Co. Ltd.	d71Civ445 S.D. N.Y.	CJ, I	May 7, 1971	
Re 25,125	White Consol. Ind. v. Maytag	d9 2473C1 S.D. Iowa	DM with prej.	Nov. 18, 1970	
Re 25,129	Fenwal Inc. v. Cutter Lab.	65 C 1124 N.D. Ill.	Dm w/p	May 13, 1968	
Re 25,147	Cessna Aircraft v. Koehring	69 C 434 E.D. Wisc.	CJ, I	Mar. 18, 1971	
Re 25,157	White Consol. Ind. v. Maytag	9 2473 C1 S.D. Iowa	Dm w/p	Nov. 18, 1970	
Re 25,171	Fenwal Inc. v. Cutter Lab.	65 C 1124 N.D. Ill.	Dm w/p	May 13, 1968	
Re 25,249	Kelly Co. Inc. v. Unarco Industries Inc.	3809 M.D. Tenn. 863 OG 15.	CJ, V, I	Dec. 12, 1968	
Re 25,311	Honeywell, Inc. v. Sperry Rand et al.	69 C 1534 N.D. Ill.	Dm w/p	Mar. 19, 1972	
Re 25,354	Photon, Inc. v. Eltra Corp. et al.	163 USPQ 165 67 C 1627 N.D. Ill.	NV, NI	Aug. 18, 1969	
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Re 25,493	Reeves Bros. Inc. v. U.S. Laminating Corp. et al.	157 USPQ 234 E.D. N.Y. 62 C 1248.	NV, NI	Jan. 23, 1968	
Re 25,542	Elox, Inc. v. Astral Prec. Equipment Inc.	69 C 2590 N.D. Ill.	CJ, I	May 2, 1972	
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Re 25,637	Am. Cyanamid Co. v. Lincoln Lab. Inc.	65 C 1481 N.D. Ill.	Dm	Aug. 14, 1969	
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Re 25,735	Lamb v. Hussman Refrigerator Co. et al.	160 USPQ 812 C.D. Oreg. 65 633.	NI	Dec. 17, 1968	
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Re 25,792	International Paper Box Machine Co. v. Specialty Automatic Machine Corp.	160 USPQ 466 66- 55-W D. Mass.	V and I	Dec. 6, 1968	
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Re 25,834	Sarkes Tarzian Inc. v. ALPS Electric Co. Ltd. et al.	70 C 22 N.D. Ill.	Dm wo/p	Oct. 19, 1970	
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Re 25,840	Amer. Cyanamid v. Pfizer	2874 D. Del.	Dm w/p	Mar. 15, 1968	
Re 25,863	Laird Silo Unloaders, Inc. v. Nutri Seal Storage Systems, Inc. et al.	876 OG 814 10139 Civil M.D. Penna.	CJ P owner of patent.	May 15, 1970	
Re 26,111	Amori et al. v. Mattos et al.	167 USPQ 67 44963 ACW N.D. Calif.	NV	Aug. 10, 1970	
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Re. 26,130	Conversion Chemical Corp. v. Dutone Chemical Co. Inc.	71 C 1528 N.D. Ill.	Dm.....	Mar. 3, 1972	
Re. 26,135	Ideal Industries, Inc. v. Whitin Machine Works, Inc.	2303 W.D.N.C.	Dm w/o p.....	Jan. 31, 1969	
Re. 26,144	Photon, Inc. v. Eltra Corp.	163 USPO 165 67 C 1627 N.D. Ill.	NV.....	Aug. 18, 1969	
Re. 26,188	Esso Research & Engineering Co. v. Pontiac Refining Corp. et al.	67 H 283 N.D. Texas.	Dm.....	June 11, 1969	
Re. 26,220	Drilling Well Control, Inc. v. Dresser Industries, Inc.	174 USPO 222 68 H 52 S.D. Texas.	V, NI.....	Dec. 30, 1971	
Re. 26,232	FMC Corp. v. Hunter Eng. Corp.	68 C 355A E.D. Mo.	NV.....	Mar. 28, 1972	
Re. 26,236	Cincinnati Shaper Co. v. Dries & Ecluse Fuel Eng. Co. v. North Amer. Mfg. Co.	68 C 1343 N.D. Ill. 67 C 1457 N.D. Ill.	Dm..... Dm.....	May 1971 Sept. 16, 1968	
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Re. 26,521	The Seeburg Corp. v. National Baron Corp.	69 C 1123 N.D. Ill.	Dm.....	Mar. 27, 1970	
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2, 129, 332	Mastini v. General Telephone & Electronics.	61 Civ 2677 S.D. N.Y.	Dm.....	Oct. 20, 1972	
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2, 328, 655	Food Machinery & Chemical Corp. v. Walker Process Equipment, Inc.	60 C 1007 N.D. Ill.	Dm.....	Mar. 26, 1969	
2, 330, 370	B. F. Goodrich Co. v. Rubber Latex Prods. Inc.	158 USPO 513 6th Cir.	NV Aff'd.....	July 29, 1968	
2, 355, 966	W. R. Grace & Co. et al. v. The U.S.	304-54 Ct. Cls.	J for P.....	July 17, 1970	
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	Technograph Printed Circuits Ltd. v. Martin Marrietta.	13 358 D. Md.	Dm.....	Dec. 23, 1970	
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	Technograph Printed Electronics Ltd. et al. v. Hoffman Electronic Corp.	62 1656 Y S.D. Calif.	Dm wo/p	Feb. 19, 1970	
	Technograph Printed Circuits Ltd. v. Methode Electronics Inc. et al.	174 USPQ 297	Estoppel found	May 31, 1972	
2, 443, 871	Grand Union v. Kingston Mfg.	160 USPQ 438	NV	Oct. 21, 1968	
2, 445, 038	The Union Metal Mfg. Co. v. Streater Dependable Mfg. Co.	67 C 1943 N.D. Ill.	Dm w/p	Dec. 16, 1969	
2, 450, 152	Miller v. Daybrook-Ottawa Corp.	158 USPQ 635	V, I	May 17, 1968	
2, 450, 462	Picker X-Ray Corp. v. Consolidated Electrodynamics Corp.	C 924-66 D. N.J.	Dm w/p	Nov. 12, 1968	
2, 452, 549	Cleaton v. Hewlett Packard Co.	173 USPQ 534	NV, I if V	Mar. 30, 1972	
2, 458, 607	Jenn-Air Corp. v. Penn Ventilator Co. Inc.	174 USPQ 419 CA 3	V, I, Aff'd	June 27, 1972	
2, 462, 625	Florman v. North American Phillips	64 C 3414 S.D.N.Y.	Dm wo/p	Mar. 19, 1968	
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2, 465, 899	Maxon v. Maxon Construction Co. Inc.	158 USPQ 77 CA 6	I Rev'd D.Ct.	May 31, 1968	
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2, 471, 413	Cleaton et al. v. Hewlett Packard Co.	173 USPQ 534	NV	Mar. 30, 1972	
2, 476, 960	FMC Corp. v. Keizer Equipment Co.	4451 E.D. Mich.	Dm w/p	Mar. 4, 1970	
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2, 481, 566	Westwood Chemical, Inc. v. Owens-Corning Fiberglass Corp.	171 USPQ 1 CA 6	NV Aff./Cl. 9	Aug. 24, 1971	
2, 497, 961	Shaw v. Non-Linear Systems Inc.	3152 S.D. Ohio	NV, NI Misrep. of art.	Nov. 4, 1969	
2, 481, 566	Westwood Chemical, Inc. v. Owens-Corning Fiberglass Corp.	168 USPQ 79	NV/NI	July 29, 1970	
2, 500, 864	Preeaus & McAlpin Co. v. Belair Ind. Inc.	65 C 24(1) E.D. Mo.	Dm	Mar. 21, 1968	
2, 507, 347	Printing Plate Supply Co. v. Arcata Graphics Corp.	1970-585 W.D.N.Y.	J	Oct. 2, 1972	
2, 507, 556	J. Bobst & Fils S.A. v. Consolidated Int'l Equip. & Supply Co.	66 C 824 N.D. Ill.	CJ, V	May 12, 1969	
2, 509, 833	Tobias Miller v. General Telephone Co.	C71-349 N.D. Ohio	NV	Dec. 11, 1972	
2, 510, 438	Plastic Contact Lens Co. v. W.R.S. Contact Lens Labs., Inc.	169 USPQ 684	Not M.	July 16, 1970	
2, 512, 084	J. Bobst & Fils S.A. v. Consolidated Int'l Equipment & Supply Co.	66 C 824 N.D. Ill.	CJ, V	May 12, 1969	
2, 513, 094	Calgon Corp. v. Dukeland	18489-C D. Md.	Dm	July 22, 1968	
	Calgon Corp. v. Nathan Mash, Inc.	18490 Civ. D. Md.	Dm	Mar. 26, 1969	
	Calgon Corp. v. Kerker Packing Co.	67 C 1081 N.D. Ill.	Dm	Feb. 26, 1969	
2, 515, 403	The Drackett Co. v. Ingle Bros. Co.	56-337-C W.D. Okla.	V, I	May 20, 1968	
2, 520, 092	Crane Co. v. Chicago Specialty Mfg. Co.	67-C-1214 N.D. Ill.	Dm	Feb. 16, 1968	
2, 520, 364	In re Hobbs AEC Pat. Comp. Bd.	165 USPQ 99	NV	Mar. 18, 1970	
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2, 526, 529	Rockform Corp. v. Kwik-Lock Form Co.	29677 E.D. Mich.	CJ	Mar. 25, 1968	
2, 531, 374	Seeburg Corp. v. Taran Enterprises Inc.	67-1058 Civ JE	I	May 12, 1969	
2, 531, 999	Baxter Laboratories Inc. v. Corn Products.	S.D. Fla. d62C1757 N.D. Ill.	NV		
2, 531, 999	Baxter Laboratories Inc. v. Corn Products Co.	157 USPQ 482 CA7	V, I Rev.	May 1, 1968	
2, 539, 168	Int. Research & Development Corp. v. Matson Navigation Co.	175 USPQ 682	I	Sept. 14, 1972	
2, 540, 345	W. A. Pipkin et al. v. FMC Corp.	66-394 CIV M.D. Fla.	SJ for def	Apr. 7, 1969	
2, 540, 955	Imperial Appliance Corp. v. Hamilton Mfg. Co.	63-C-291 E.D. Wis.	Dm w/p	Sept. 20, 1971	
2, 544, 246	George H. Butterfield, Jr. v. Erie Contact Lens Laboratory, Inc.	98-69CA Erie W.D. Pa.	I	Nov. 17, 1969	
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	George H. Butterfield v. John S. Milan Optical Co. Inc.	5680 M.D. Tenn.-----	Dm-----	Sep. 30, 1970	
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	George H. Butterfield v. C-R Contact Lens Inc.	13669 N.D. Ga.-----	Dm-----	July 13, 1970	
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	George H. Butterfield v. No-Con Lab. Inc.	70-C-167(1) C.D. Mo.-----	Dm-----	May 30, 1970	
	George H. Butterfield v. Hunter Optical Co.	70-744-FW C.D. Calif.-----	Dm-----	May 30, 1970	
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2, 552, 433	Hazeltine Research Inc. v. Zenith Radio Corp.	161-USPQ 577 Sup. Ct. 49.-----	M, Inj.-----	May 19, 1969	
2, 554, 844	John H. Kirby et al. v. Schlumberger Well Surveying Corp.	63-H-392 S.D. Texas.-----	Dm w/p-----	Feb. 24, 1970	
	McCullough Tool Co. v. Well Surveys Inc.	158 USPQ 81-----	I-----	May 16, 1968	
2, 555, 962	Well Surveys Inc. v. Perfo-Log Inc.	153 USPQ 113 CA10.-----	S.I. of M rev'd.-----	June 4, 1968	
2, 560, 655	Alice Einstein v. Betty Laine Inc.	68-C-1045 S.D. N.Y.-----	Dm-----	Aug. 20, 1968	
2, 561, 080	Marvel Specialty Co. v. Magnet Mills.	161 USPQ 412-----	NV-----	Mar. 28, 1969	
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2, 563, 794	Merck & Co. v. Gotham Pharmaceutical Co.	63-C-417 E.D. N.Y.-----	CJ, Inj.-----	June 19, 1968	
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2, 564, 700	Phillips Petroleum v. Sid Richardson Carbon.	160 USPQ 251-----	NI-----	Sept. 7, 1968	
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2, 568, 250	Decca Limited v. The United States.	160 USPQ 739, 164 USPQ 348.-----	NV-----	Jan. 23, 1970	
2, 569, 462	Picker X-Ray Corp. v. Consolidated Electrodynamics Corp.	C924-66 D. N.J.-----	Dm w/p-----	Nov. 12, 1968	
2, 570, 193	International Nickel Co. Inc. v. Cameron Iron Works, Inc.	68-H-894 S.D. Texas.-----	Dm-----	Oct. 9, 1970	
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2, 587, 568	Technograph Printed Electronics, Ltd. et al. v. Hoffman Electronic Corp.	164 USPQ 586 S.D. Calif.	Dm wo/p-----	Feb. 19, 1970	
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2, 588, 744	Elox, Inc. v. Astral Precision Equipment Co.	69-C-2590 N.D. Ill.	CJ, def I-----	Mar. 2, 1972	
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2, 600, 236	Allied-Witan v. Richard B. Freeman & Bennett Co.	dC66-148 N.D. Ohio	Dm, w/p-----	Jan. 3, 1968	
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2, 604, 313	Grantham et al. v. Morgan Linen Service, Inc.	d68C252 N.D. Ill.	Dm-----	July 28, 1969	
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2, 609, 653	Prefomed Line Products Co. v. Faner Manufacturing Co.	d33196 N.D. Ohio	Dm w/p-----	Oct. 29, 1969	
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2, 614, 916	Ansul Co. et al. v. Uniroyal, Inc.	162 PQ 525 S.D.N.Y.	Cl. 1 NV, Cl. 7 V & I.	June 6, 1969	
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2, 617, 470	Fletcher v. Mohasco Ind.	d67C739 N.D. Ill.	CJ	Feb. 29, 1968	
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2, 619, 420	American Cyanamid Co. v. Houston Chemical Distributors, Inc.	d12433 N.D. Georgia	Dm w/p	Feb. 19, 1969	
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2, 622, 733	Pipkin et al. v. FMC Corp.	162 PQ 400 E.D. Pa. d66-394-Civ Md Fla.	NV, NI SJ for Def.	Apr. 28, 1969 Apr. 4, 1969	
2, 624, 634	Rockwell-Standard Corp. v. Gar Wood Industries, Inc.	d29583 E.D. Mich.	Dm	May 27, 1969	
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2, 625, 335	Gretner, A.G. v. Dyson-Kissner Corp.	d66 Civ. 3966 S.D. N.Y.	Dm	Dec. 1, 1969	
2, 625, 683	Bell-Topex, Inc. v. James E. Charleson et al.	d67-1287F C.D. Calif.	Dm	June 21, 1971	
2, 625, 683	United Tanks, Inc. v. Sears Roebuck & Co.	158 USPQ 589 C.D. Calif.	NV	May 16, 1968	
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2, 628, 330	Elox, Inc. v. Astral Equipment Co.	d69C2590 N.D. Ill.	CJ, I	May 2, 1972	
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2, 628, 576	Jacob S. Finke v. Keebler Co.	d68C1215 N.D. Ill.	Dm, w/p	Dec. 20, 1968	
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2, 629, 134	Barr Rubber Prod. Co. v. Sun Rubber Co. et al.	60 Civ 4327 S.D.N.Y.	CJ, I	July 6, 1971	
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2, 633, 164	Rome Plow Co. v. Thomas A. Billings et al.	d65-90 Orl. MD Fla.	V & I	Jan. 8, 1968	
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2, 637, 893	Shaw et al. v. E.B. & A.C. Whiting Co.	163 PQ 580 CA2	V & I Rev. in part Dm.	Nov. 5, 1969	
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2, 641, 390	Sherbondy v. Time Savers Inc.	d 992-66 D.N.J.	CJ.....	May 17, 1968	
2, 641, 596	M & T Chemicals Inc. v. Carlisle Chemical Works Inc.	d529-65 D. New Jersey.	Dm.....	Oct. 8, 1969	
2, 641, 879	International Glass Co. Inc. v. United States.	159 USPQ 434	N/v if V N/I.	July 23, 1968	
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2, 643, 890	K & W Trucking Inc. et al. v. Eight Point Trailer Corp.	164PQ 35 CA9	I Aff.....	Nov. 25, 1969	
2, 644, 651	Precision Paper Tube Co. v. Precise Paper Products Co. et al.	d68C475 N.D. Ill.	CJ.....	Jan. 7, 1969	
2, 646, 665	Edward A. Rockwell et al. v. Midland Ross Corp.	66C202 N.D. Ill.	Dm w/p.....	Sept. 23, 1969	
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2, 644, 151	Seal Incorp. v. Technol Corp. & Bogen Photo Corp.	360-70 D.C. N.J.	Dm.....	Sept. 24, 1971	
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2, 647, 590	Advanced Hydraulics v. Clark Equip.	68C865 N.D. Ill.	NI.....	Apr. 26, 1971	
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2, 648, 327	Air Shield Inc. v. Air Reduction Co.	169 USPQ 450	NV. NI.....	Mar. 18, 1971	
2, 648, 428	Fabricated Metals Inc. v. Hoover Ball & Bearing Co.	d45148 N.D. California.	NV.....	May 28, 1968	
2, 648, 650	M & T Chemicals, Inc. v. Carlisle Chemical Works, Inc.	529-65 D. N.J.	Dm.....	Oct. 8, 1969	
2, 649, 674	Bartelt Engineering Co., Inc. v. Pneumatic Scale Corp.	d66-106J D. Mass.	NV, NI.....	Apr. 15, 1969	
2, 649, 730	W. A. Pipkin et al. v. FMC Corp.	d66-394-Civ. M.D. Fla.	SJ for Def.....	Apr. 7, 1969	
2, 650, 979	Elox, Inc. v. Astral Precision Equipment Co.	d69C2590 N.D. Ill.	CJ, I.....	May 2, 1972	
2, 652, 402	Morton Norwich Products v. Hunter.	69-223 E.D. La.	CJ, Inj.....	June 11, 1971	
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2, 653, 526	Compugraphic Corp. v. Eltra Corp. et al.	70C1961 N.D. Ill.	CJ, V & I.....	Dec. 16, 1970	
2, 654, 256	Elox, Inc. v. Astral Precision Equip. Co.	69C2590 N.D. Ill.	CJ, I.....	May 2, 1972	
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2, 658, 496	Hoglund Engineering & Mfg. Co., Inc. v. J & S Tool Co., Inc. et al.	d404 67 D. N.J.	Dm.....	May 19, 1969	
2, 659, 212	V & S Ice Mach. Co. v. Esatex Poultry.	168 PQ 389 VA5	Iff. AN.....	Jan. 15, 1971	
2, 661, 534	Keiser v. J. Wiss & Sons Co.	173 USPQ594	I if V, NV.....	Mar. 24, 1972	
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2, 667, 243	National Steel Corp. v. B & O RR et al.	166 USPQ 9	NV, NI.....	June 15, 1970	
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2, 672, 675	Cross Co. v. Bahr Machine Tool Co.	173 PQ 47	V, I	Feb. 28, 1972	
2, 673, 194	Koppers Inc. v. Foster Grant Co. Inc.	158 USPQ241 CA1	NV, Aff	June 6, 1968	
2, 673, 575	John Donald Marshall et al. Trustee for The Carolina Patent Dev. Trust v. Baxter Textile Machines Inc. et al.	166 USPQ535	NI	May 11, 1970	
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2, 676, 471	Larchmont Engineering Inc. v. Ratnik Industries Inc. et al.	dCiv 11 847 W.D.N.Y.	CJ	May 12, 1969	
2, 677, 145	Roberts Consolidated Industries Inc. v. Gilbert Smith d/b/a West Coast Metal Mouldings.	d68-1726-E.C. C.D. Calif.	V, I	June 16, 1969	
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2, 689, 611	Martinson Mfg. Co., Inc. v. Herb Maass Service Inc.	d69-C-5 E.D. Wis.	I, Inj	Sept. 17, 1970	
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2,775,707	Pickler X-ray Corp. et al v. Consolidated Electro Dynamics.	C924-66 D. N.J.....	DM w/p.....	Nov. 12, 1968	
2,776,214	Armour & Co. v. Standard Brands Inc.	3502 D. Del.....	DM w/p.....	May 3, 1971	
2,777,926	Bourns v. Dale Electronics.....	165PQ296 D. Nebr.....	NV.....	Dec. 29, 1969	
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2,778,617	Air Shields Inc. v. Air Reduction Co. Inc.	169USPQ450 N.D. III.....	NV.....	Mar. 18, 1971	
2,778,637	Ohio Citizens' Trust v. Lear Jet Corp..	160PQ11 CA10.....	NV Aff.....	Dec. 3, 1968	
2,778,637	Ohio Citizens Tr. Co. et al v. Audio Devices Inc.	66Civ2093 S.D. N.Y.....	DM.....	May 15, 1969	
2,779,196	Bishner Mfg. Co. et al v. Stewart Warner	65C897 N.D. III.....	CJ-V I.....	Jan. 22, 1968	
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2,779,374	Clarence E. Clark v. Castle Sporting Goods, Inc. et al.	67C216 N.D. III.....	DM.....	Apr. 27, 1969	
2,780,988	W. A. Pipkin et al. v. FMC Corp.....	66394Civ M.D. Fla.....	SJ for Def.....	Apr. 7, 1969	
2,782,251	Belden Mfg. Co. v. Saxton Products, Inc.	66 Civ4324 S.D. N.Y.....	DM.....	Nov. 15, 1968	
2,783,377	Blair v. Westinghouse Electric Corp..	160PQ155 D.D.C.....	NV.....	Oct. 24, 1968	
2,783,411	Elox, Inc. v. Astral Prec. Equipment Inc.	69C2590 N.D. III.....	CJ-I.....	May 2, 1972	
2,784,038	Metal Apts Co. v. Fuller Co.....	156USPQ605 CA5.....	VI Aff.....	Feb. 6, 1968	
2,784,132	Union Carbide Corp. v. Microtron.....	2042 W.D. NC.....	DM.....	May 3, 1968	
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2,784,318	Pickler X-Ray Corp. v. Consol. Electro-dynamics Corp.	C924-66 D. NJ.....	DM w/p.....	Jan. 12, 1968	
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2,784,955	Compton et al. v. Metal Products Inc..	172PQ263 CA4.....	M., Rev.....	Dec. 16, 1971	
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2,794,417	Ransburg Electro-Coating Corp. v. Lansdale Finishers Inc. et al.	174USPQ407.....	V, I.....	Jun. 21, 1972	
2,796,370	Allied Research Products Inc. et al. v. Heatbath Corp. et al.	161PQ527.....	V, I.....	Apr. 2, 1969	
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2,798,120	Sonotone Corp. v. Rivertone Co. Inc..		DM w/p.....	Jan. 7, 1970	
2,798,226	E-Z Clasp, Inc. v. France Neckwear Co. Inc.	67Civ2620 S.D.N.Y.....	DM.....	Apr. 2, 1968	
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2,784,955	Salem Tool Co. v. Charles Compton et al	2578 S.D. W. Va.....	DM.....	Oct. 19, 1972	
2,786,480	Howard D. Taylor et al. v. Sybron Corp.	1967-322 W.D.N.Y.....	DM wo/p.....	Apr. 29, 1970	
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2,787,654	Compugraphic Corp. v. Eltra Corp. et al.	70C1961 N.D. III.....	CJ, V, I.....	Dec. 16, 1970	
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2,790,516	Dunlop Co. Ltd. v. Kelsey-Hayes Co..	30629 E.D. Mich.....	I.....	May 19, 1972	
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2,800,252	Wahl v. Carrier Mfg. Co.....	161 PQ 481.....	I.....	Oct. 16, 1968	
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2,802,257	AMP Inc. v. ETC Inc.	C69-337 C.D. Ohio.	V, I	Oct. 2, 1969	
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2,804,401	Faraday Inc. v. RCA Corp.	71C2679 N.D. Ill.	DM	Nov. 11, 1971	
2,804,554	Dual Lite Co. v. Mallard Mfg. Co.	8757 C.D. Conn.	DM	Mar. 7, 1971	
2,804,571	Tektronix v. U.S.	79-61 Ct. Claims 170 PQ 100.	V, I	June 11, 1971	
2,804,575	Elox Inc. v. Astral Prec Equipment Inc.	69C2590 N.D. Ill.	CJ, I	May 2, 1972	
2,804,633	Garrett Corp. v. U.S.	162 PQ 568	V & I	June 23, 1969	
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2,804,935	Maloney Crawford Tank Corp. et al. v. Sander Tank.	W-4130 D. Kansas	V, I	Feb. 16, 1971	
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2,806,131	Palmer v. U.S.	163 PQ 250	V, I	Sept. 9, 1969	
2,806,131	Samuel L. Palmer et al. v. U.S.	165 PQ 88	V, I	Mar. 20, 1970	
2,806,532	Kiva Corp. v. Baker Oil Tools Inc.	7-231 ND Texas	nV	June 3, 1968	
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2,806,956	Pickner XRay Corp. et al. v. Consolidated Electrodynamics Corp.	C 924-66 C NJ	DM w/p	Nov. 12, 1968	
2,807,659	Cool-Fin Electronics Corp. v. International Electronics Res. Corp.	174 PQ 4	nV	May 22, 1970	
2,808,626	Weather Control Shutters v. Bernards Alum. Fabricators.	70 1257 S.D. Fla.	DM w/p	Mar. 11, 1971	
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2,810,206	Empire Level Mfg. Co. et al. v. Ace Hardware Corp.	69 C 1149 N.D. Ill.	DM wo/p	Feb. 18, 1972	
2,810,815	Still Man Mfg. & Thero-Craft v. Wiegand Co.	379-66 D.N.J.	DM	Jan. 2, 1968	
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2,813,185	Raytheon v. Sanyo Denk KK.	70 C 52 ND Ill.	DM w/p	Mar. 25, 1971	
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2,814,990	Printing Plate Supply Co. v. Arcata Graphics Corp.	1970-585 WD NY	CJ	Oct. 2, 1972	
2,815,846	Stevenson v. Diebold Inc.	165 PQ 10 CA9	nV Rev	Feb. 2, 1970	
2,817,195	Gaynor et al. v. Diamond Alkali	125-69 D NJ	DM	June 24, 1971	
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2,817,737	Neoweld Corp. & Conn Div. Credit Corp. v. Cooper Electroheat Ltd.	1030-70 D.N.J.	CJ, V, I	May 23, 1972	
2,817,737	Neoweld Corp. et al. v. Cooperheat et al.	1534-70 D.N.J.	CJ, V, I	May 24, 1972	
2,820,188	Honeywell Inc. v. Sperry Rand et al.	69 C 1534 N.D. Ill.	DM w/p	Mar. 24, 1972	
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2,823,775	Aro Corp. v. Mich. Pneumatic Tool et al.	35671 E.D. Mich.	CJ, Inj	Dec. 11, 1970	
2,823,828	Frates et al. v. Pickney Molded Plastics.	32744 E.D. Mich.	CJ, Inj	Aug. 12, 1971	
2,824,315	Hendry Co. v. Manolides Inc.	7294 W.D. Wash.	DM	Jan. 29, 1970	
2,825,927	Laitram Corp. v. Deepsouth Packing Co. Inc.	67-861 E.D. Louisiana 162 PQ 14.	V, I/Cl I nV/ Cl 12, 15, 17, 18.	Apr. 7, 1969	
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2, 826, 694	Tektronix v. U.S.	170 PQ 100	V, I	June 11, 1971	
2, 826, 828	The Welch Scientific Co. v. The Numan Engr. Inst. Inc.	67 C 1267 N.D. Ill.	DM	June 5, 1968	
2, 826, 783	Supermold Corp. v. Sheehan Tire Retreading.	14627 D. Conn.	DM	Feb. 23, 1972	
2, 827, 665	Diamond Shamrock Corp. v. Good- year Tire & Rubber Co.	1365-69 D.N.J.	DM	Jan. 6, 1972	
2, 827, 913	Watsco v. Henry Valve	160 PQ 161 CA2	I, Rev	Dec. 12, 1968	
2, 828, 088	Denison-Johnson v. True Temper Corp.	C 67759 N.D. Ohio	CJ, V, I	June 22, 1971	
2, 828, 895	Polytop Corp. v. U.S. Cap & Closure Inc.	d67C1586 N.D. Ill.	DM w/p	June 12, 1968	
2, 830, 431	Deering Milliken Research Corp. v. Vecchioni	d69C2324 N.D. Ill.	DM w/p	July 28, 1972	
2, 830, 548	Equipco Contractors Inc. McElram v. George Grant Const. Co.	d3108 E.D. Wash.	DM	June 5, 1968	
2, 831, 237	Bridgeport Machine Co. v. Leon Herter et al.	d69-752 CC C.D. Calif.	CJ, V, INJ	May 14, 1969	
2, 834, 178	Deering Milliken Res. Corp. v. C. Vecchioni.	d69C2324 N.D. Ill.	DM w/p	July 28, 1972	
2, 834, 511	Booth et al v. Victor Products Corp.	d15892 D. Md.	DM w/p	Mar. 16, 1971	
2, 834, 809	Scott Paper Co. v. Ft. Howard Paper Co.	167 PQ 4 CA7	NV, Aff	Sept. 4, 1970	
2, 834, 809	do.	d60-C-156 E.D. Wis.	DM	June 16, 1972	
2, 836, 344	Imperial Packaging Corp. v. Bahamas Paper Co. Ltd.	d70-Civ1247 S.D. N.Y.	DM	Sept. 23, 1970	
2, 839, 196	Prelin Ind. Inc. v. G & G Crafts Inc.	175 PQ 744 W.D. Okla.	NI, M, F, Laches.	Sept. 15, 1972	
2, 840, 459	Blaw Knox Co. v. Hartsville Oil Mill.	157 PQ 475 CA4	V, NI, Rev. in part.	Apr. 2, 1968	B of I.
2, 840, 962	Sturtevant Ind. Inc. v. Stremke et al.	d65-C-231 E.D. Wis.	I	Apr. 4, 1968	
2, 841, 056	Custom Paper Products Co. v. Atlantic Paper Box Co.	173 PQ 505 D. Mass.	NV	Apr. 12, 1972	
2, 841, 056	do.	175 PQ 678 CA1	NV, Aff	Nov. 9, 1972	
2, 841, 056	Howard F. Hinchey et al v. Robt. A. Smiley et al.	d69C438(3) E.D. Mo.	I	Apr. 13, 1970	
2, 841, 124	Hydrotherm Inc. v. Intragas S. A.	d640-72 D.N.J.	DM	May 23, 1972	
2, 841, 124	Automation Industries Inc. v. Baier	d656-72 D.N.J.	DM	May 23, 1972	
2, 841, 414	A. J. Industries, Inc. v. Dayton Steel Foundry Co.	157 PQ 545 6th Cir.	NV, Aff	May 6, 1968	
2, 841, 566	Westwood Chem Inc. v. Owens-Corn- ing Fiberglass Corp.	168 PQ 79 N.D. Ohio	NV, NI	July 29, 1970	
2, 841, 566	do.	171 PQ 1 CA6	NV, Aff	Aug. 24, 1971	
2, 841, 686	Elox, Inc. v. Astral Prec. Equip. Inc.	d69C2590 N.D. Ill.	CJ, I	May 2, 1972	
2, 842, 170	Porter-Cable Machine v. Black & Decker Mfg. Co.	159 PQ 65 CA4	V, I, Aff	Sept. 13, 1968	
2, 842, 772	Nelson Planning, Ltd. v. Oxford Mfg. Co.	d9948 N.D. Ga.	DM w/p	June 18, 1970	
2, 842, 772	Nelson Planning Ltd. v. Tex-O-Graph Corp.	158 PQ 122 S.D.N.Y.	NV, NI	Feb. 2, 1968	
2, 842, 772	do.	165 PQ 673 CA2	NV, Aff	Feb. 5, 1970	
2, 843, 408	Stuckenborg v. Teledyne	169 PQ 584 CA9	NV, NI, SJ Aff.	Apr. 12, 1971	
2, 843, 513	Allied Research Corp. v. Eltzroth & Assoc. Inc.	d70C621 N.D. Ill.	DM	Jan 5, 1972	
2, 843, 935	Gerber Scientific Instrument v. Colligan et al.	d71-258-J D. Mass.	DM	Dec. 21, 1971	
2, 846, 223	Marlin Toy Products, Inc v. Sidney a. Tarrson, Co.	d67C832 N.D. Ill.	INJ	Nov. 27, 1968	
2, 846, 278	Lempco Industries, Inc. v. Superior Die Set Corp.	d69-C-360 E.D. Wis.	DM w/p	Feb. 14, 1972	
2, 846, 342	Gaynor et al. v. Diamond Alkali	d125-69 D. N.J.	DM	June 24, 1971	
2, 846, 756	Warner & Swasey Co. v. Held	160PQ74 E.D. Wis	V, NI	June 27, 1968	
2, 846, 756	Warner & Swasey v. Held	162PQ452 CA7	NI, Aff.	July 14, 1969	
2, 847, 313	Tee-Pack Inc. v. St. Regis Paper Co.	dC671-1094 N.D. Ohio	SJ	Dec. 22, 1972	
2, 848, 045	Louwer Drape Inc. et al. v. M Klahr Inc.	d65Civ2733 S.D.N.Y.	DM w/p	Feb. 11, 1970	
2, 848, 334	Roberts Dairy Corp. v. Marshall Pro- duce Co.	d4-67C-341 D. Minn.	DM w/p	June 20, 1968	
2, 850, 280	J. Bobst & Fils S. A. v. Consolidated International Equipment & Supply Co.	66 C 824 N.D. Ill.	CJ, V	May 12, 1969	
2, 850, 814	Ellicott Machine Corp. v. United States et al.	157PQ149	NV	Mar. 11, 1968	
2, 850, 814	Ellicott Machine Corp. v. United States.	160PQ753	NV	Jan. 24, 1969	
2, 851, 372	M. S. Kaplan Co. v. Prefinish Metal, Inc.	65 C 1045 N.D. Ill.	CJ	Aug. 25, 1969	
2, 851, 386	Allied Research, Inc. v. Eltzroth & Assoc., Inc.	70 C 621 N.D. Ind.	Dm	Jan. 5, 1972	

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2,853,032	Mohasco Industries, Inc. v. Sequoyah Mills, Inc.	66-61 W.D. Okla.	Dm	Apr. 16, 1968	
2,853,033	Mohasco Industries, Inc. v. Sequoyah Mills, Inc.	66-61 W.D. Okla.	Dm	Apr. 16, 1968	
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2,854,190	Purer & Co. v. Aktiebolaget Addo	161PQ270 CA9	Aff. V, I	Mar. 14, 1969	
2,854,839	Adams Rite Mfg. Co. v. Lumidor Mfg. Co.	68-1294 Civ. Tc S.D. Fla.	I	Mar. 27, 1969	
2,855,010	Kockum Industries, Inc. v. Brunette Machine Works, Ltd.	CIV 69-42 D. Oreg.	Dm	Feb. 20, 1969	
2,855,010	Kockum Industries, Inc. v. Salem Equipment, Inc. et al.	175PQ81 CA9	J of NV vacated.	Aug. 14, 1972	
2,855,735	Whittaker Corp. v. Litho Color Printing Corp.	C 68-295 N.D. Ohio.	V, INJ	Aug. 3, 1970	
2,856,229	Adell Manufacturing et al. v. Victra Sales, et al.	30272 E.D. Mich.	CJ, INJ	May 14, 1971	
2,856,653	Sutter Products Co. v. Pettibone Mulliken Corp.	166PQ100 CA7	Aff. NV	June 5, 1970	
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2,859,684	King Coffee Filter Co., Inc. et al. v. Anex Corp. et al.	10202 W.D.N.Y.	Dm w/p	Feb. 3, 1969	
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2,861,731	Stromberg Carlson Products, Inc. v. Diversified Mfg. Co., et al.	12113 N.D. Ga.	CJ	Apr. 4, 1969	
2,861,860	Zaidan v. Borg-Warner Corp.	157PQ347	SJ, NI	Feb. 21, 1968	
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2,865,984	Printing Developments, Inc. v. RCA Corp.	69-2290 S.D.N.Y.	Dm	July 6, 1970	
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2,867,017	Sutter Products Co. v. Pettibone Mulliken Corp.	166PQ100 CA7	NV Aff.	June 5, 1970	
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2,869,078	Coulter Electronics, Inc. v. NYW et al.	67 Civ 3419 S.D.N.Y.	Dm	Aug. 31, 1970	
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2,869,216	F. H. Hill Co., Inc. v. Nat. Casket Co., Inc.	C 68-301 N.D. Ohio.	Dm	June 19, 1970	
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2,869,460	Worthington v. Southern N.J. Newspapers, Inc.	167PQ598	NV, NI	May 13, 1970	
2,869,754	Booth et al. v. Victor Products Corp.	15-892 D. Md.	Dm w/p	Mar. 16, 1971	
2,870,548	Aetna Casualty & Surety Co. v. Singer General Precision.	3855 D. Del.	Dm	June 21, 1972	
2,870,840	Paper Converting Mach. Co., v. FMC Corp.	161PQ67 CA7	Aff. I	Mar. 20, 1969	
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2,875,777	Robinair Man. Corp. v. Jarrow-Brinda, Inc.	68 C 1722 N.D. III	Dm w/p	Nov. 24, 1969	
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2,878,514	David & David, Inc., v. Myerson	156PQ353 CA2	Aff. NV	Jan. 9, 1968	
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2,882,244	Union Carbide Corp. v. Filtrol Corp.	170PQ483	V, I	Apr. 29, 1971	
2,882,384	Foster v. Magnetic Heating Corp.	161PQ153 CA2	Aff. V, I	Mar. 20, 1969	
2,883,255	Scam Instrument Corp. v. IBM	67 C 200 N.L. III	Dm	May 27, 1968	
2,883,255	Scam Instrument Corp. v. Control Data Corp.	69 C 1725 N.D. III	Dm	Aug. 20, 1969	
2,883,255	Scam Instrument Corp. v. Control Data Corp. et al.	68 C 930 N.D. III	Dm	Aug. 20, 1969	

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2, 883, 927	Air-Impac Co. v. Columbia Marking Tools, Inc.	447 E.D. Mich.	Dm w/p	Feb. 29, 1972	
2, 884, 288	Roller Bearing Co. v. Bearings, Inc.	168PQ648	NV	Feb. 2, 1971	
2, 884, 649	George A. Scharmer v. Agnew Associates, Inc.	66 C 85 E.D.N.Y.	Dm w/p	Nov. 19, 1970	
2, 885, 248	White et al. v. Fafnir Bearing Co.	156PQ857 CA2	Aff. V, I	Feb. 9, 1968	
2, 885, 824	Jerome H. Lemelson v. Sears, Roebuck & Co., et al.	11,811 D. Conn.	Dm w/p	Aug. 27, 1969	
2, 885, 824	Jerome H. Lemelson v. Daisy Mfg. Corp.	64 Civ 2853 S.D.N.Y.	Dm w/p	Aug. 28, 1969	
2, 887, 338	Adell Mfg. et al. v. Victra Sales et al.	30272 E.D. Mich.	CJ, INJ	May 14, 1971	
2, 887, 584	High Voltage Engineering Corp. v. Boise-Cascade Corp.	Civ 1-68-79 D. Idaho.	Dm	Feb. 18, 1970	
2, 877, 584	High Voltage Engineering Corp. v. Boise-Cascade Corp. at al.	3549 D. Del.	Dm wo/p	Mar. 3, 1969	
2, 890, 027	Patterson-Kelley v. General Machine Co.	1241-69 D.N.J.	CJ, INJ	July 12, 1971	
2, 890, 573	Lamb v. Hussman Refrigerator Co., et al.	160PQ812	NI	Dec. 17, 1968	
2, 890, 612	Kell-Strom Tool Co. v. Advance Hydraulics Inc.	CA 68-18-C D. Mass.	CJ, Dm	May 17, 1968	
2, 892, 151	Homco International, Inc. v. Gearhart-Owen Industries, Inc. et al.	CA 4-1936 N.D. Texas.	CJ, I	May 15, 1972	
2, 892, 574	Walter Kidde & Co., Inc. v. Leland Industries, Inc. et al.	670-66 D.N.J.	Dm	Aug. 11, 1969	
2, 892, 911	General Electric Co. v. Westinghouse Electric Co.	1971-452 W.D.N.Y.	Dm	July 6, 1972	
2, 892, 912	General Electric Co. v. Westinghouse Electric Co.	1971-452 W.D.N.Y.	Dm	July 6, 1972	
2, 893, 004	Finney Mfg. Co., et al. v. Electronic Components Distributors, Inc.	67 H 819 S.D. Texas.	Dm	May 12, 1969	
2, 893, 893	Ransburg Electro Coating v. King, Ind.	70 C 991 N.D. Ill.	I	Dec. 22, 1972	
2, 893, 893	Ransburg Electro Coating Corp. v. Std. Container.	167PQ426	V, I	Mar. 27, 1970	
2, 893, 893	Ransburg Electro Coating Corp. v. Lansdale Finishers, Inc.	174PQ407	V	June 21, 1972	
2, 893, 894	Ransburg Electro Coating Corp. v. Std. Container.	167PQ426	V, I	Mar. 27, 1970	
2, 893, 894	Ransburg Electro Coating Corp. v. Lansdale Finishers, Inc.	174PQ407	V	June 21, 1972	
2, 893, 894	Ransburg Electro Coating Corp. v. King Ind.	70 C 991 N.D. Ill.	I	Dec. 22, 1972	
2, 895, 003	Heyman Mfg. Co., v. Richlock Corp.	67 C 801 N.D. Ill.	Dm	Dec. 4, 1970	
2, 895, 450	Werner Machinery Co. v. National Cooperatives, Inc.	67 C 394 E.D. Wis.	Dm		
2, 895, 570	J. Bobst & Fils S.A. v. Consolidated International Equipment & Supply Co.	66 C 824 N.D. Ill.	CJ, V	May 12, 1969	
2, 895, 821	Brian Jackson Assoc., Inc. et al. v. San Manuel Copper Corp. et al.	163PQ198	I	Apr. 24, 1969	
2, 895, 950	Broadview Chemical Corp. v. Loctite Corp.	159PQ80	I, INJ	June 20, 1968	
2, 895, 950	Loctite Corp. v. Eastern Bearing, Inc.	Civ 999-67 D.N.J.	V, I; INJ	May 6, 1970	
2, 895, 950	Broadview Chemical Corp. v. Loctite Corp.	162PQ139	INJ	May 10, 1969	
2, 895, 950	Broadview Chemical Corp. v. Loctite Corp.	171PQ65	NI	June 30, 1971	
2, 896, 284	Gateway Industries, Inc. v. Greenfield Co.	67 C 122 N.D. Ill.	Dm w/p	Nov. 22, 1968	
2, 896, 347	Proctor-Silex Corp. v. Arvin Industries, Inc.	162PQ203	NV, NI	Mar. 17, 1969	
2, 896, 857	Malsbury Mfg. Co. et al. v. Ald, Inc.	165PQ241	V, I, INJ	Mar. 3, 1970	
2, 896, 857	Malsbury Mfg. Co. et al. v. Ald, Inc.	171PQ7 CA7	V, I Aff.	Aug. 12, 1971	
2, 896, 857	Malsbury Mfg. Co. et al. v. Custom Power Washer, Inc.	C 68-737 N.D. Ohio.	CJ, V, INJ	Sept. 15, 1972	
2, 896, 857	Malsbury Mfg. Co. v. Orbit Car-Wash.	CA 5-535 N.D. Texas.	CJ, V, INJ	Jan. 14, 1971	
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2, 897, 497	Finney Mfg. Co. et al. v. Electronic Component Distributors, Inc.	67 H 819 S.D. Tex.	Dm w/p	May 12, 1969	
2, 897, 840	Marion R. Roberts et al. v. Goodyear Tire & Rubber Co.	C 68-237 N.D. Ohio.	Dm w/p	Mar. 20, 1970	
2, 899, 242	Bombardier Snowmobile Ltd. v. Lakeshore Amusement Co. (Inc.).	29263 E.D. Mich.	I	Aug. 7, 1970	
2, 901, 385	Gaynor et al. v. Diamond Alkali	125-69 D.N.J.	DM	June 24, 1971	
2, 902, 041	Helena Rubinstein v. Bau	167PQ711 CA9	NV, AFF	Nov. 9, 1970	
2, 902, 940	Hudson Engineering Company et ano v. Bingham Pump Company.	64 Civ 3811 S.D. N.Y.	DM	Sept. 8, 1969	

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2,905,445	Blumcraft et al. v. Architectural Mfg., Inc. et al.	172PQ460	c.e., NV, SJ	Jan. 7, 1972	
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2,904,449	Continental Coatings Corp. v. Metco, Inc.	174PQ423 CA7	SJ, Laches, AFF.	July 21, 1972	
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2,905,445	Blumcraft et al. v. Citizens & So. Nat. Bank of S. Car.	158PQ642	V, I	May 29, 1968	
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2,905,445	Blumcraft et al. v. Kawneer Co., Inc. et al.	166PQ265	SJ/c.e., denied.	June 4, 1970	
2,905,445	Blumcraft of Pitts. v. Kawneer Co., Inc., et al.	172PQ43	SJ/c.e. denied on recon.	Nov. 16, 1971	
2,905,465	Magnavox v. NCR et al.	68C1001 N.D. Ill.	DM	Dec. 21, 1970	
2,905,601	Sel-Rex Corp. v. Scripto, Inc.	D9137 N.D. Ga.	DM	Sept. 30, 1969	
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2,907,614	Rosen v. Kahlenberg	171PQ386	V, I, Inj.	Aug. 10, 1971	
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2,908,302	Carl W. Mullis et al. v. E. S. Adking Co.	D13978 D. Md.	DM	Apr. 8, 1970	
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2,908,831	Brevet Products Corp. v. Keystone Camp Mfg. Corp.	D67Civ2900	CJ, Inj.	Oct. 17, 1967	
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2,909,384	Engineered Prods. Co. v. U.S. Ind. Prod. Corp. et al.	D70C933 E.D.N.Y.	CJ	Mar. 6, 1972	
2,909,934	Sarkes Tarzian Inc. v. Standard Kollsman Industries, Inc.	D69C80 N.D. Ill.	DM	Jan. 14, 1969	
2,910,377	MMM Co. v. Labelon Corp.	D69-5435 S.D.N.Y.	Inj.	Feb. 13, 1970	
2,911,339	American Cyanamid v. Pfizer	D2874 D. Del.	DM, wo/p	Mar. 15, 1968	
2,911,339	Nopco Chemical Co. v. Amer. Cyanamid Co.	D1291-66 D.N.J.	DM	Jan. 22, 1969	
2,913,046	Northrup Architectural Sys. v. Fullview Ind. Inc.	161PQ772	SJ Cl. 3, NV, Cls. 6, 7, 9, 10, 15, 16 NI.	Apr. 25, 1969	
2,913,046	Northrup Architectural Systems v. Lupton Mfg. Co.	168PQ623 CA9	SJ denied, REV.	Jan. 28, 1971	
2,913,386	Beckman Instruments, Inc. et al. v. Chemtronics, Ind. et al.	160PQ619	V, NI	Dec. 30, 1968	
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2,913,973	Bull v. Log Etronics, Inc.	168PQ342	NV	Jan. 5, 1971	
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2,914,823	Stockham Valves and Fittings Inc. v. Arthur J. Schmitt Foundation et al.	159PQ705 CA5	V, I, AFF.	Nov. 22, 1968	
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2,916,007	Outboard Marine Corp. v. Brunswick Corp.	D67C639 N.D. Ill.	DM	May 28, 1968	
2,916,185	Leesona Corp. v. Seigle	157PQ344	SJ, NV	Feb. 6, 1968	
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2, 917, 790	Schumacher Co. v. Reynolds Co. et al.	C66-371 N.D. Ohio	J for Def	Feb. 25, 1972	
2, 917, 885	Sturtevant Industries, Inc. v. Strenke et al.	D65C23 E.D. Wis.	I	Apr. 4, 1968	
2, 917, 886	Sturtevant Industries, Inc. v. Strenke et al.	D65C23 E.D. Wis.	I	Apr. 4, 1968	
2, 918, 310	Carson v. Bland	158PQ529 CA10	NV, AFF	July 10, 1968	
2, 919, 042	John M. Calimfde v. Levin Metals, Corp.	D50132 N.D. Calif.	CJ, V	Aug. 6, 1969	
2, 919, 042	Kierulf v. Scrap Loaders Inc.	DC-67-595 D. Oreg. (Portland)	CJ, DM	June 26, 1968	
2, 919, 042	Jorgen V. Kierulf v. Michael Schiavone & Sons, Inc.	D12362 D. Conn.	DM	June 23, 1969	
2, 919, 061	Norton Co. et al. v. Bendix Corp.	D1968-361 W.D. N.Y.	V, I	Nov. 26, 1971	
2, 919, 061	Norton Co. v. Bendix Corp.	171PQ449 CA2	NV, REV	Dec. 22, 1971	
2, 919, 061	NRC Equipment Corp. et al. v. Consolidated Vacuum Corp.	D10884 E.D.N.Y.	DM	Mar. 10, 1972	
2, 919, 506	Esco Corp. v. Hensley Equipment Co., Inc.	156PQ642	V, I, M (purged).	Jan. 26, 1968	
2, 919, 506	Esco Corp. v. Tru-Roll Co.	176PQ163	V, I	Dec. 11, 1972	
2, 919, 534	Deering Milliken Research Corp. v. Burlington Ind.	D67-C-50-C W.D. Va.	DM	May 22, 1968	
2, 919, 990	National Dairy Prods. v. Borden Co. et al.	157PQ227 CA7	V, REV	Mar. 26, 1968	
2, 920, 990	Nat. Dairy Prod. Corp. v. Swiss Colony.	176PQ405	V 1-6, I 1,3, 4, NI 2,5,6.	Dec. 29, 1972	
2, 920, 971	Corning Glass Works v. Anchor Hocking Glass Corp.	163PQ268	I, Inj	July 15, 1969	
2, 921, 650	Dunlop Co. Ltd. v. Kelsey-Hayes Co.	D30629 E.D. Mich.	I	May 19, 1972	
2, 921, 786	Cutting Room Appliances Corp. v. Sam Zuckerman Sewing Machine Corp.	D68Civ278 S.D.N.Y.	DM	May 26, 1970	
2, 921, 786	Cutting Room Appliances Corp. v. ABCD Equipment, Inc.	D68Civ277 S.D.N.Y.	CJ, Inj	Nov. 13, 1968	
2, 922, 883	SCM v. RCA	167PQ196	NV	Sept. 28, 1970	
2, 922, 990	SCAM Instrument Corp. v. Control Data Corp.	D69C1725 N.D. Ill.	DM	Aug. 20, 1969	
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2, 923, 144	Maytag v. General Motors Corp.	N.D. Ill.	DM	Nov. 24, 1971	
2, 923, 242	Ronald H. Klair as exec. of estate Howard P. Klair v. U.S.	D24-67 Ct. of Cl.	J	Aug. 21, 1970	
2, 923, 406	III. Tool Works Inc. v. Bruning et al.	156PQ610 CA9	NI, AFF	Jan. 5, 1968	
2, 923, 553	Seeburg Corp. of Delaware v. Specialty Sales Corp. of America.	D69C220 N.D. Ill.	DM w/p	Apr. 1, 1970	
2, 923, 605	Clevite Corp. et al. v. Howard Aiken Ind. Inc.	D3252 D. Del.	I, Inj	Dec. 5, 1969	
2, 923, 846	David M. Goodman v. Philco Corp.	D65Civ951 S.D.N.Y.	DM	Apr. 6, 1970	
2, 925, 625	Dyno Industries Inc. v. Com-Tech Inc. et al.	156PQ611 CA9	NV, AFF	Jan. 17, 1968	
2, 925, 665	Maytag Co. v. Hoover Co.	D70C2946 N.D. Ill.	DM	Oct. 12, 1971	
2, 925, 719	Hospital Marketing Services Co., Inc. v. Kwik-Kold, Inc.	DN71C32 E.D. Mo.	CJ, V, I	Oct. 10, 1972	
2, 925, 719	Kwik-Kold, Inc. v. Kendall Co.	D69C698 N.D. Ill.	DM	Sep. 29, 1969	
2, 926, 154	Hercules Inc. v. Pacific Resins	D7156 E.D. Wash.	DM	Nov. 5, 1970	
2, 926, 420	Boling v. Home Window Co., Inc.	DC69-308 N.D. Ohio	CJ, Inj	May 1, 1972	
2, 928, 562	Leach Co. v. Gen Sani-Can Mfg. Corp.	D64C1675 N.D. Ill.	V, I, Inj	May 15, 1970	
2, 929, 228	Edward A. Gould, Jr. v. Cornelius Co.	D4-66Civ329 D. Minn.	DM	Feb. 18, 1969	
2, 930, 840	Heyman Mfg. v. Richlock Corp.	67C801 N.D. Ill.	DM	Dec. 4, 1970	
2, 930, 986	Tektronix v. U.S.	170PQ100	V, I	June 11, 1971	
2, 932, 397	Paddock of California, Inc. v. National Filtronic, Inc.	70-352-S N.D. Ala.	V, Inj	Sep. 30, 1971	
2, 933, 333	Aerogroup Corp. v. Crane Co.	D38436 E.D. Mich.	DM	June 12, 1972	
2, 933, 558	Hazeltine Research v. Firestone Tire & Rubber Co.	171PQ481	V, NI	Oct. 4, 1971	
2, 933, 558	Hazeltine Research v. Firestone Tire & Rubber Co.	176PQ17 CA4	NI, AFF	Nov. 15, 1972	
2, 934, 230	Richard D. Tracey v. Perkins Machinery Co., Inc.	D67-419-J D. Mass.	DM w/p	May 6, 1969	
2, 934, 932	Tile Council of America, Inc. v. Ceramic Tiles Supply, Inc.	159PQ204	V	June 26, 1968	
2, 934, 932	Tile Council of America v. Garland White & Co., Inc.	D71-2125 N.D. Calif.	CJ for plaintiff.	May 23, 1972	
2, 934, 932	Tile Council v. Chicago Mastic	D69C2242 N.D. Ill.	V, I	Apr. 12, 1971	
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2, 935, 716	Bourns v. Dale Electronics.....	165PQ276.....	NV.....	Dec. 29, 1969	
2, 935, 794	Aetna Casualty & Surety Co. v. Singer-General Precision et al.	D3855 D. Del.....	DM.....	June 21, 1972	
2, 935, 932	J. Bobst & Fils S.A. v. Consolidated Int'l. Equip. & Supply Co.	D66C824.....	CJ, V.....	May 12, 1969	
2, 936, 899	Precision Metal Products Inc. v. Brunor.	D70-344 S.D. Fla.....	DM wo/p.....	Nov. 24, 1971	
2, 937, 065	Water Seals, Inc. v. Tiger Industries, Inc. et al.	D68-H-60S.D. Tex....	V. I. Inj.....	Feb. 23, 1970	
2, 938, 279	Singer General Precision Inc. v. Farland Optical Co., Inc.	D69Civ1772 S.D.N.Y.	DM.....	Jan. 7, 1970	
2, 938, 718	Di-Dro Engr. Co. v. Die Draulic et al....	D5043 W.D. Mich.....	DM wo/p.....	June 18, 1968	
2, 939, 707	Lemelson v. Ideal Toy Corp.....	159PQ783.....	SJ, NI.....	July 12, 1968	
2, 940, 495	Std. Pressed Steel Co. v. Hi-Shear Corp.	D408-68 D.N.J.....	DM.....	Aug. 22, 1968	
2, 942, 172	General Radio v. Kepco.....	168PQ65 CA2.....	NV, REV.....	Nov. 27, 1970	
2, 942, 429	Gordon Johnson Co. et al. v. Ralph S. Zebarth et al.	D16336-4 W.D. Mo....	I, Inj.....	Jan. 20, 1969	
2, 942, 512	Wurlitzer Co. v. Kjos Music Co.....	D71C1146 N.D. Ill.....	DM.....	July 12, 1971	
2, 942, 512	Wurlitzer Co. v. Chicago Musical Inst. Co.	D71C1145 N.D. Ill.....	DM w/p.....	Nov. 8, 1971	
2, 942, 768	Mach Chicago Corp. v. Sturdi Box Corp.	d70C1496 E.D.N.Y.....	CJ, Inj.....	Apr. 9, 1971	
2, 943, 019	Motron Norwich Prod. v. Hunter.....	d69-223 E.D. La.....	CJ, Inj.....	June 11, 1971	
2, 943, 839	DeLaval Turbine, Inc. v. Garrett Corp..	d6214 D. Ariz.....	Dm, w/p.....	Apr. 21, 1972	
2, 945, 533	Fletcher v. Mohasco Ind.....	d67C739 W.D. Ill.....	CJ.....	Feb. 29, 1968	
2, 945, 582	Triangle Leather Goods Co. et al. v. Abraham et al.	d70C2923 N.D. Ill.....	Dm, w/p.....	Aug. 5, 1971	
2, 946, 069	Corcoran Shoe Co., Inc. v. Noone Shoe Co., Inc. et al.	d69-1651 S.D.N.Y.....	Dm.....	Mar. 31, 1972	
2, 947, 104	Woodstream Corp. v. Herter's, Inc.....	165PQ609.....	NV.....	May 7, 1970	
2, 947, 104	Woodstream Corp. v. Herter's, Inc.....	170PQ380 CA 8.....	AFF, NV.....	June 28, 1971	
2, 947, 544	Ranco Fertiliservice, Inc. v. Arthur A. Hurt.	d69C3021W N.D. Ill.....	Dm.....	Oct. 6, 1969	
2, 948, 252	Outboard Marine Corp. v. Brunswick Corp.	d67C639 N.D. Ill.....	Dm, wo/p.....	May 28, 1968	
2, 948, 372	White Consol. Ind. v. Maytag.....	d9-2473C1 S.D. Iowa.....	Dm, w/p.....	Nov. 18, 1970	
2, 948, 524	Carborundum Co. v. Metal Transfer, Inc.	dC70-31 N.D. Ohio....	V. I, Inj.....	Oct. 17, 1972	
2, 948, 899	Robert E. Allen d/b/a, Bob Allen's Gun Club Sportswear v. Ideal Products et al.	163PQ176.....	SJ, NV, NI.....	June 11, 1969	
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2, 948, 928	Mobay Chemical Co. et al. v. Hudson Foam.	363-71 D.N.J.....	Dm.....	June 23, 1971	B of I.
2, 949, 053	Wurlitzer v. Kjos Music Co.....	d71C1146 N.D. Ill.....	Dm.....	July 12, 1971	
2, 949, 053	Wurlitzer Co. v. Chicago Musical Inst. Co.	d71C1145 N.D. Ill.....	Dm, w/p.....	Nov. 8, 1971	
2, 949, 297	J. Bobst & Fils S.A. v. Consolidated Int'l. Equip. & Supply Co.	d66C824 N.D. Ill.....	CJ, V.....	May 12, 1969	
2, 949, 580	Sarkes Tarzian Inc. v. Standard Kollsman Industries, Inc.	d68C80 N.D. Ill.....	Dm.....	Jan. 14, 1969	
2, 950, 016	U.S. v. Saf-T-Boom Corp. et al.....	164PQ283.....	N V, F.....	Jan. 16, 1970	
2, 950, 016	U.S. v. Saf-T-Boom.....	167PQ195 CA8.....	AFF, NV, F.....	Sep. 30, 1970	
2, 950, 203	Groen v. General Foods Corp.....	159PQ332 CA9.....	AFF, NV.....	Oct. 4, 1968	
2, 951, 260	Crown Machine & Tool v. KVP Sutherland Paper Co.	d42224 N.D. Calif.....	V.....	May 9, 1968	
2, 951, 260	Crown Machine & Tool Co. v. D & S Industries.	160PQ584 CA9.....	V, NI Aff'd.....	Feb. 13, 1969	
2, 951, 761	Puget Sound Salmon Egg Co. v. Shoshoni, Inc.	168PQ154.....	V, I.....	Nov. 6, 1970	
2, 951, 761	Puget Sound Salmon Egg Co., Inc. v. Lucky Brands, Inc.	dCivl-69-60 D Idaho (Boise)	Inj.....	Sep. 2, 1970	
2, 952, 851	Melvin Epstein v. Dennison Man. Co..	164PQ291.....	NV.....	Oct. 30, 1969	
2, 953, 279	Block et al. v. Continental Disc Corp	d16752-4 W.D. Mo....	I, Inj.....	Mar. 25, 1970	
2, 953, 317	Gretner, A.G. v. Dyson-Kissner Corp..	d66Civ3966 S.D. N.Y.	Dm.....	Dec. 1, 1969	
2, 953, 354	Williams Bit & Tool Co. et al. v. American Coldset Corp.	d3-2957-A N.D. Tex.	I, Inj.....	Mar. 18, 1970	
2, 953, 354	Williams Bit and Tool Co. v. Christensen Diamond Products Co.	159PQ11 CA 5.....	V, I, Rev.....	Aug. 19, 1968	
2, 953, 763	Bourns v. Dale Electronics.....	165PQ296.....	NV.....	Dec. 24, 1969	
2, 954, 052	Cessna Aircraft v. Koehring.....	d69C434 E.D. Wis.....	CJ, I.....	Mar. 18, 1971	
2, 954, 073	Bela Seating Co., Inc. v. Polaron Products, Inc. et al.	160PQ646.....	V, I, Inj.....	Jan. 16, 1969	
2, 954, 073	Bela Seating Co. v. Textron, Inc.....	d66C1046 N.D. Ill.....	V, I.....	May 20, 1969	
2, 954, 073	Bela Seating Co. v. Polaron Products.	168PQ548 CA7.....	V, I Aff.....	Jan. 25, 1971	
2, 954, 907	Harold R. Bird d/b/a Vanbar Co. v. Zimmerman Fur Institute, Inc. et al.	d6610 S.D. Ohio.....	V, I.....	Jan. 2, 1969	

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2,956,073	Shell Oil Co. v. Carlstadt Chem. Co., Inc. et al.	dC1320-68 D.N.J.	Inj.	Aug. 10, 1970	
2,956,073	Shell Oil Co. v. Barco Corp. et al.	171PQ78	Inj.	May 7, 1971	
2,956,073	Shell Oil Co. v. Norda	d 68-3115 S.D.N.Y.	CJ, Inj.	July 15, 1969	
2,956,114	Ampex Corp. v. Matsushita Electric Corp. of America.	d67C2023 N.D. Ill.	Dm.	June 26, 1969	
2,956,143	Raytheon v. Sanyo Denki KK.	d70C52 N.D. Ill.	Dm, w/p	Mar. 25, 1971	
2,957,793	Reeves Bros. Inc. v. U.S. Laminating Corp. et al.	157PQ235	NV, NI	Jan. 23, 1968	
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2,958,138	Maytag Co. v. Hoover Co.	d70C2946 N.D. Ill.	Dm.	Oct. 12, 1971	
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2,958,593	MMM v. Morton Co., et al.	165PQ755 CA6	AFF, NV	June 1, 1970	
2,958,872	Meyer, Jr. v. Roslyn Cover Co.	d70C1386 E.D.N.Y.	CJ	June 21, 1972	
2,958,872	Mayer v. Major Pool Equip. Corp.	dC1222-70 D.N.J.	Dm.	Nov. 10, 1970	
2,960,328	A. H. Emery Co. v. Marcan Products Corp.	d62CW265 D.S.N.Y.	J for P	Apr. 7, 1971	
2,960,755	Homco International Inc. v. Gear- hart-Owen Industries, Inc. et al.	dCA4-1936 D.N. Tex.	CJ, I	May 15, 1972	
2,961,602	Homco International Inc. v. Gear- hart-Owen Industries, Inc. et al.	dCA4-1936 N.D. Tex.	CJ, I	May 15, 1972	
2,961,624	Homco International Inc. v. Gear- hart-Owen Industries, Inc. et al.	dCA4-1936 N.D. Tex.	CJ, I	May 15, 1972	
2,962,764	Kahn v. Western Union Telegraph Co.	d66-C-966 S.D.N.Y.	Dm, wo/p	June 26, 1968	
2,962,837	Lemelson v. Deluxe Reading Corp.	168PQ636	V, NI	Jan. 14, 1971	
2,962,837	Jerome H. Lemelson v. Ideal Toy Corp.	d68Civ4890 S.D.N.Y.	Dm, w/p	June 18, 1970	
2,962,837	Jerome H. Lemelson v. Sears, Roe- buck & Co. et al.	d11, 811 D. Conn.	Dm, w/p	Aug. 27, 1969	
2,962,837	Jerome H. Lemelson v. Daisy Manu- facturing Corp.	d64Civ2853 S.D.N.Y.	Dm, w/p	Aug. 28, 1969	
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2,964,083	General Tire & Rubber Co. v. Fire- stone Tire & Rubber Co.	174PQ427	V, I	June 26, 1972	B of A, Dist. Ct.
2,964,641	Micro-Magnetic Ind. Inc. v. Advance Automatic Sales Co., Inc.	175PQ331	V, I, Inj.	July 17, 1972	
2,964,833	Warner A Swasey Co. v. Held	160PC74	V, n/i	June 27, 1968	
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2,967,030	Whitcomb v. American Airlines Inc.	164PQ610	V, I	Apr. 5, 1968	
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2,967,623	Central Specialties Co. v. Robert G. Schaefer et al.	165PQ15	N/I	Feb. 12, 1970	
2,967,672	Link Engineering Co. v. Lincoln Tool & Mfg. Co.	d67-C142 E.D. Wis.	V, I, Inj.	Apr. 2, 1969	
2,967,701	Wilcox Mfg. Co. v. Eastern Gas & Fuel Assoc.	158FQ510 CA 4	AFF, NV, NI	July 18, 1968	
2,967,778	Sparto Prods., Inc. v. Coca-Cola Co.	158PQ625 CA 3	NV Aff.	Aug. 13, 1968	
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2, 974, 055	Metal Film Co. v. Metlon Corp.....	d64Civ508 S.D.N.Y.	Dm.....	Jan. 20, 1971	
2, 974, 426	Colt's Inc. v. Bangor Pinta Operations, Inc.	d14534 D. Conn.	Dm.....	Feb. 3, 1972	
2, 974, 432	Jack Winter Inc. v. Koratron Co., Inc. et al.	170PQ316.....	SJ.....	Apr. 12, 1971	
2, 974, 467	Long Mfg. Co. v. Lilliston Implement Co.	171PQ228.....	NV.....	June 14, 1971	
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2, 974, 721	Thomas v. Kramer.....	d64C-774-E.D.N.Y.	Dm, w/p.....	Jan. 16, 1968	
2, 974, 852	Am. Can. Co. v. DSC of Newark.....	d592-68 D.N.J.	Dm.....	Nov. 6, 1969	
2, 975, 670	Singer General Precision Inc. v. Farrand Optical Co., Inc.	d69Civ1772 S.D.N.Y.	Dm.....	Jan. 7, 1970	
2, 975, 671	Singer General Precision Inc. v. Farrand Optical Co., Inc.	d69Civ1772 S.D.N.Y.	Dm.....	Jan. 7, 1970	
2, 975, 814	George A. Tinnerman v. Tinnerman Products, Inc.	dC68-62 N.D. Ohio	Dm.....	June 24, 1970	
2, 976, 576	Griffith Labs v. Nat'l Pat. Dev. Corp..	dCiv1970-212 WD NY.	Dm.....	May 14, 1971	
2, 977, 839	Polymer Corp. v. I.T.E. Imperial Corp..	d68C1571 N.D. Ill.	Dm.....	Oct. 24, 1968	
2, 979, 062	Ajem Labs. v. C.M. Ladd Co.	161PC400.....	NV.....	Apr. 1, 1969	
2, 979, 062	Ajem Laboratories Inc. et al. v. C.M. Ladd Co., Inc. et al.	165PQ737 CA6.....	AFF, NV.....	Apr. 29, 1970	
2, 979, 119	Kramer v. Living Aluminum, Inc. et al.	d69-968 S.D.N.Y.	Dm.....	Oct. 24, 1971	
2, 979, 119	Hyman Kramer d/b/a Kramer Enterprises v. Duralite Co., Inc.	d64Civ1704 S.D.N.Y.	I, Inj.....	Mar. 20, 1970	
2, 979, 119	Kramer v. G & A Machine Works, Inc..	d67-3600 S.D.N.Y.	Dm.....	May 15, 1972	
2, 979, 381	Union Carbide v. Filtrrol Corp.....	170PQ482.....	NV.....	Apr. 29, 1971	
2, 980, 012	Ramirez v. Perez.....	173PQ263 CA5.....	NV, AFF.....	Mar. 24, 1972	
2, 980, 982	Eastman Kodak Co. v. Indian Head Inc.	d71-345 N.D. Ala.	Dm.....	Feb. 8, 1971	
2, 981, 689	Indiana General Corp. v. Lockheed Aircraft.	160PQ6 CA9.....	SJ, NV, REV.....	Nov. 25, 1968	
2, 982, 145	Harry Orner v. Scully-Jones Co.....	d69C1693 N.D. Ill.	Dm.....	Feb. 19, 1970	
2, 982, 819	Hammond Corp. v. Kinematic Inc.....	d67C1426 N.D. Ill.	Dm.....	May 28, 1968	
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2, 983, 601	Latrobe Steel Co. v. Atlas Steel Co., Ltd.	dC64-567 N.D. Ohio	CJ.....	Dec. 17, 1968	
2, 985, 363	Purer & Co. v. Aktiebolaget ADDO.....	161PQ270 CA9.....	V, I, AFF.....	Mar. 14, 1969	
2, 985, 800	Particle Data Lab. Inc. v. Coulter Electronics, Inc.	d64C1032 N.D. Ill.	Dm.....	May 6, 1970	
2, 985, 830	Coulter Electronics Inc. v. N. Y. W. et al.	d67Civ3419 S.D.N.Y.	Dm.....	Aug. 31, 1970	
2, 987, 610	Deep Welding Inc. v. Sciaky Bros. Inc..	163PQ144 CA7.....	NV, Rev.....	Aug. 13, 1969	
2, 987, 704	Scam Instrument Corp. v. Control Data Corp.	d69C1725 N.D. Ill.	Dm.....	Aug. 20, 1969	
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2, 989, 594	Nye Systems, Inc. v. Lanier Business Products, Inc.	d8374 W.D. Wash.	Dm.....	
2, 988, 259	Boas Box v. Proper Folding Box.....	170PQ123 E.D.N.Y.	N/V.....	Apr. 30, 1971	
2, 988, 604	Nye Systems, Inc. v. Lanier Business Products, Inc.	d8374W.D., Wash.	Dm.....	
2, 989, 767	Sherwin-Williams v. Man. Brush Co....	dC67-917, N.D. Ohio..	Inj.....	July 1, 1970	
2, 989, 852	Edward A. Rockwell et al. v. Midland Ross Corp.	d66C202 N.D. Ill.	Dm.....	Sept. 23, 1969	
2, 990, 094	Diamond International Corp. v. Waltherhofer.	159PQ452.....	V, I.....	July 26, 1968	
2, 990, 094	Diamond International Corp. v. Herkimer Pulp and Packaging Corp.	dCiv8917 N.D.N.Y.	V, Inj.....	Oct. 21, 1968	
2, 990, 094	Diamond International Corp. v. Harry C. Waltherhofer, Jr. et al.	d13152 CA4th Cir....	Dm.....	Feb. 13, 1969	
	Diamond International Corp. v. Dolco Packaging Corp.	21200 Civ C.D. Md....	Inj.....	Mar. 26, 1969	
	Diamond International Corp. v. Harry C. Waltonhofer, Jr. et al.	14510 Civ D. Md....	Inj.....	Apr. 10, 1969	
2, 990, 190	Standard Ind. Inc. v. Tigrett Ind. Inc..	3121 D. Del.....	Dm.....	Nov. 3, 1970	
2, 990, 382	Tile Council of America, Inc. v. Ceramic Tilers Supply, Inc.	159 USPQ 204.....	V.....	June 26, 1968	
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	Ceramic Tilers Suppliers v. Tile Council of America, Inc.	196 USPQ 268 CA9....	V, Aff.....	Mar. 22, 1971	
2, 990, 997	Continental Can Co. Inc. v. Old Dominion Box Co. Inc.	157 USPQ 353 CA2....	NV, Aff.....	Apr. 8, 1968	

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	Morris Bean & Co. v. Reichhold Chemicals Inc.	169 USPQ 813	V, I	Mar. 25, 1971	
	Morris Bean & Co. v. Reichhold Chemicals.	169 USPQ 813	Inj.	Apr. 2, 1971	
2,991,398	Helen Willis Strong et al. v. General Electric Co.	162 USPQ 141	NV	June 13, 1969	
	Helen Willis Strong et al. v. Milbank Man. Co.	16604-3 W.D. Mo.	NV	Mar. 3, 1970	
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2,991,491	Misty Wells Corp. v. Balax Inc.	160 USPQ 265	NV	Sept. 9, 1968	
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2,993,479	Black, Sivalls & Bryson, Inc. v. Na- tional Tank Co.	171 USPQ 17 CA10	SJ, Rev.	Aug. 9, 1971	
2,993,535	Edgar K. Orr v. Verticals Inc.	66-508 S.D.N.Y.	Dm.	Feb. 11, 1970	
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2,993,664	Honeywell Inc. v. Sperry Rand et al.	69C1534 N.D. Ill.	Dm.	Mar. 29, 1972	
2,994,119	T.E.L. Pre-Cast Corp. et al. v. Gagne Enterprises et al.	70C1542 N.D. Ill.	Dm.	Feb. 22, 1972	
2,995,271	Lewis v. Molded Fiber Glass Co.	C69-158 N.D. Ohio	Dm.	Dec. 8, 1971	
2,995,617	Nat. Connector Corp. v. Malco Mfg. et al.	157 USPQ 401 CA8	NV, Rev.	Apr. 11, 1968	
2,995,999	Galland-Henning Mfg. Co. v. Dempster Bros.	165 USPQ 688	NV	Apr. 15, 1970	
2,996,822	Dymo Industries Inc. v. Com-Tech Inc. et al.	156 USPQ 611 CA9	NV, Rev.	Jan. 17, 1968	
2,997,173	Magnavox v. NCR et al.	68C1001 N.D. Ill.	Dm.	Dec. 21, 1970	
2,997,231	Continental Enterprises v. McCarthy	65C634 N.D. Ill.	Dm.	Jan. 5, 1968	
2,998,611	Schuessler Knitting Foundation v. American Needle and Novelty Co.	160 USPQ 694	V, I, Inj.	Dec. 19, 1968	
2,998,656	Andrew Eisele d/b/a Zero Internal Gage Co. v. John P. St. Amour.	29070 D.E. Mich.	V, I	Jan. 6, 1969	
	Eisele v. St. Amour.	161USPQ79 165 USPQ 161 CA6.	NV, Rev.	Mar. 25, 1970	
2,998,765	Elgo Shutter & Mfg. Co. v. Air Condi- tioning Products Co. et al.	30613 E.D. Mich.	CJ, Inj.	Sept. 11, 1969	
2,998,927	Aghnides v. Wadworth	172 USPQ 275 D. Md.	NV, NI	Dec. 1, 1971 Jan. 6, 1972	B of A., D. Court 127 USPQ 445.
2,999,322	Singer General Precision Inc. v. Far- rand Optical Co., Inc.	69 Civ 1772 S.D.N.Y.	Dm.	Jan. 7, 1970	
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3,000,070	T-E-L Pre-Cast Corp. et al. v. Gagne Enterprises et al.	70 C 1542 N.D. Ill.	Dm w/p	Feb. 22, 1972	
3,000,576	Binks Manufacturing Co. v. Spee-Flo Manufacturing Corp.	157PQ358 CA5	Aff. V, I	Apr. 18, 1968	
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3,001,416	J. Bobst & Fils S.A. v. Consolidated International Equipment & Supply Co.	66 C 824 N.D. Ill.	CJ, V	May 12, 1969	
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3,002,240	John L. Rie, Inc., v. Am. Sponge & Chamois Co., Inc.	68C 1209 E.D.N.Y.	CJ	Nov. 21, 1969	
3,002,388	Bada Co. v. Montgomery Ward & Co.	165PQ483 CA9	NV AFF	Apr. 28, 1970	
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3,010,245	Woodstream Corp. v. Herter's, Inc.	165PQ609	NV	May 7, 1970	
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3,016,140	Magnavox v. NCR et al.	68 C 1001 N.D. Ill.	Dm	Dec. 21, 1970	
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3,016,441	Emerson Electric Co. v. Heath Craft, Inc. et al.	5535 M.D. Tenn.	INJ	Sept. 8, 1970	
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3, 036, 928	Cataphote Corp. v. Crystalex Mfg. Co.	C-941-62 D.N.J.	V, I	Mar. 25, 1968	
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3, 037, 414	Hammond Corp. v. Kinematic, Inc.	67 C 1426 N.D. Ill.	Dm w/p	May 28, 1968	
3, 037, 659	William H. Frederick et al. v. Strongcraft Products, Inc.	67-1530-CC C.D. Calif.	Dm	June 2, 1969	
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3, 038, 363	Wurlitzer Co., v. Kjos Music Co.	71 C 1146 N.D. Ill.	Dm	July 12, 1971	
3, 038, 534	Louver Drape, Inc. et al. v. M. Klahr, Inc.	65 Civ 2733 S.D. N.Y.	Dm w/p	Feb. 11, 1970	
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3, 041, 187	General Mills, Inc. v. Danberg Flock Mfg., Inc. et al.	13215 D. Conn.	INJ	Sept. 21, 1970	
3, 041, 963	Cincinnati Shaffer Co., v. Davis & Krump Co.	68 C 1343 N.D. Ill.	NV	May 7, 1971	
3, 042, 113	Hyman Kramer d/b/a Kramer Enterprises v. Duralite Co., Inc.	64 Civ 1704 S.D. N.Y.	I, IMJ	Mar. 20, 1970	
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3, 042, 113	Kramer v. Living Aluminum, Inc. et al.	65 968 S.D.N.Y.	Dm w/p	Oct. 27, 1971	
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3, 043, 310	Diapulse Corp. of America v. O. J. Tracy	65 C 1210 N.D. Ill.	Dm	Mar. 2, 1968	
3, 043, 445	Holmes v. Thew Shovel Co.	162PQ559	V, I	July 1, 1969	
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3, 043, 820	Broadview Chemical Corp. v. Loctite Corp.	162PQ139	INJ	May 10, 1969	
3, 043, 820	Loctite Corp. v. Eastern Bearing, Inc.	Civ 999-67 D.N.J.	V, I, INJ	May 6, 1970	
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3, 044, 878	John E. Mitchell Co., et al. v. The Cornelius Co., et al.	3-2209 N.D. Tex.	V, I	July 27, 1970	
3, 045, 102	Springfield Wire, Inc. v. G.E. Co., et al.	67 C 868 N.D. Ill.	J	Sept. 23, 1970	
3, 045, 406	Sturtevant Ind., Inc. v. Stremke et al.	65 C 231 E.D. Wisc.	I	Apr. 4, 1968	
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3, 046, 108	International Nickel Co., Inc. v. Cameron Iron Works, Inc.	68-H-894 S.D. Texas.	Dm	Oct. 9, 1970	
3, 046, 262	Broadview Chemical Corp. v. Loctite Corp.	159PQ80	I, INJ	June 20, 1968	
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3, 046, 262	Broadview Chemical Corp. v. Loctite Corp.	171PQ65	NI	June 30, 1971	
3, 046, 805	Van Corp. Mfg. v. Townley Industrial Plastics, Inc.	70-Y-Civ OC M.D. Fla.	J	Jan. 8, 1971	
3, 046, 875	J. Bobst & Fils S.A. v. Consolidated International Equipment & Supply Co.	66 C 824 N.D. Ill.	CJ, V	May 12, 1969	
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3, 048, 498	Ransburg Electro Coating Corp. v. Nordson Corp.	158PQ385	V, I	June 14, 1968	
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3, 048, 996	Russell v. Best Universal Lock Co., Inc.	159PQ364	V, NI	July 3, 1968	
3, 049, 256	GAR Wood Industries, Inc. v. The Heil Co.	27853 E.D. Mich.	CJ	July 10, 1968	
3, 050, 087	H. K. Porter Co., Inc. v. Goodyear Tire & Rubber Co.	163PQ106	V, I, INJ	July 1, 1969	
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3, 050, 186	Allen Bradley Co. v. Air Reduction Co.	157PQ183 CA3	Aff. NV	Mar. 21, 1968	
3, 050, 755	Besly-Welles Corp. v. Balax, Inc.	160PQ265	NV, I if V	Sept. 9, 1968	
3, 050, 755	Bendix Corp. v. Balax, Inc.	164PQ485 CA7	Aff. NV but I if V	Jan. 30, 1970	
3, 050, 755	Bendix Corp. et al. v. Balax, Inc., et al.	168PQ461	M	Jan. 8, 1971	
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3, 051, 411	Gretner, A. G. v. Dyson Kissner Corp.	66 Civ 3966 S.D. N.Y.	Dm	Dec. 1, 1969	
3, 052, 319	Swanson et al. v. Folding Carrier Corp.	70-530 W.D. Okla.	Dm, NI	May 22, 1972	
3, 052, 319	Swanson v. Unarco Industries	173PQ788	NI	Apr. 17, 1971	
3, 052, 539	SCM v. RCA	167PQ196	NV, I if V	Sept. 28, 1970	B of A D.C., D.C.
3, 052, 540	SCM v. RCA	167PQ196	NV	Sept. 28, 1970	
3, 052, 540	Nashua Corp. v. RCA Corp.	165PQ89	NV, NI	Dec. 19, 1969	
3, 052, 540	Nashua Corp. v. RCA Corp.	166PQ449 CA1	Aff. NV, NI	Aug. 3, 1970	
3, 054, 282	Bacon v. Gen. Motors Corp.	30550 E.D. Mich.	Dm w/p	Mar. 13, 1968	
3, 054, 446	Louver drape, Inc., et al. v. M. Klahr, Inc.	65 Civ 2733 S.D.N.Y.	Dm w/p	Feb. 11, 1970	
3, 054, 594	ACF Industries v. Hecht et al.	W-3222 D. Kansas	INJ	Nov. 18, 1971	
3, 055, 014	Fancee Free Mfg. Co. v. Leon-Roth	67 CIV 508 S.D.N.Y.	CJ, INJ	Feb. 3, 1971	
3, 055, 221	Bada Co. v. Montgomery Ward & Co.	165PQ483 CA9	NV, Aff	Apr. 28, 1970	
3, 055, 280	Anderson's-Black Rock, Inc. v. Pavement Salvage Co., Inc.	163PQ673 Sup. Ct.	NV	Dec. 8, 1969	
3, 055, 705	Wilson v. Midwest Folding Products Mfg. Corp.	175PQ649	NV, NI	Oct. 10, 1972	
3, 055, 988	Shure Bros., Inc. v. Pickering	63 C 1306 N.D. Ill.	CJ, INJ	Mar. 15, 1968	
3, 056, 224	Armstrong Cork Co. v. Kentile Floors, Inc.	1168-67 D.N.J.	Dm	Dec. 13, 1971	
3, 056, 684	Carboline Co. v. Mobil Finishes Co., Inc. et al.	163PQ273	V, I	May 14, 1969	
3, 056, 928	Cataphote Corp. v. DeSoto Chemical Coatings, Inc.	171PQ737 CA9	Aff. I	Nov. 4, 1971	
3, 057, 195	Syston-Donner Corp. v. Schrevitz Eng.	261-69 D.N.J.	Dm wo/p	May 21, 1970	
3, 057, 467	Canaan Products, Inc. v. Edward Don & Co., et al.	156PQ295 CA5	V, I Aff	Jan. 8, 1968	
3, 057, 467	Holland-Rantos Co., Inc. v. Canaan Products, Inc.	66 C 3944 S.D.N.Y.	Dm w/p	May 31, 1968	
3, 058, 663	Robertshaw Controls Co., v. Honeywell, Inc.	68 1132-S C.D. Calif.	Dm w/o p	July 3, 1969	
3, 058, 920	Chemithon Corp. v. Proctor & Gamble Co., et al.	159PQ139	NV	June 25, 1968 July 3, 1968	
3, 058, 920	The Chemithon Corp. v. The Proctor & Gamble Co.	165PQ678 CA4	Aff. NV	June 2, 1970	
3, 059, 081	Gen. Electric Co. v. Westinghouse Electric Corp.	3600 D. Del.	Dm wo/p	Dec. 30, 1968	
3, 059, 458	Wayne Knitting Mills v. Russell Hosiery Miles, Inc.	159PQ6 CA4	Rev. NV	Sept. 10, 1968	
3, 059, 674	Boling v. Home Window Co., Inc.	C 69 308 N.D. Ohio	CJ, INJ	May 1, 1972	
3, 060, 776	J. Bobst & Fils S.A. v. Consolidated International Equipment & Supply Co.	66 C 824 N.D. Ill.	CJ, V	May 12, 1969	
3, 061, 005	Edgar K. Orr v. Verticals, Inc.	66-508 S.D.N.Y.	Dm w/p	Feb. 11, 1970	
3, 061, 005	Edgar K. Orr v. Verticals, Inc.	62-3274 S.D.N.Y.	Dm w/p	Feb. 11, 1970	
3, 061, 005	Louver drape Inc. et al. v. M. Klahr, Inc.	65 Civ 2733 S.D.N.Y.	Dm w/p	Feb. 11, 1970	
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3, 061, 271	Jones v. O. A. Newton & Son Co.	167PQ152	NI	Sept. 29, 1970	
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3, 137, 119	Duplan Corp. v. Deering Milliken etc.	D.S.C. Doc. 71-306.....	NV.....	Jan. 17, 1972	
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3, 154, 240	Nash Engr. Co. v. Aqua-Chem, Inc.	E.O. Wisc. Doc. 70-C-553.	CJ-v-inj	Apr. 5, 1972	
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3, 155, 766	Technitrol Inc. v. Aladdin Industries Inc.	ND Illinois 67 C 2067 1966 PQ 4	Claims 1-4 & 6-9 NV	Apr. 27, 1970	
3, 155, 809	Digital Sensors, Inc. v. Wems, Inc. et al.	C.D. Calif. 65-1049- HW.	V & I & INJ	June 30, 1969	
3, 155, 809	Ansley West Corp. v. Elco Corp.	C D Cal	cl. 1-7 V	?	
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3, 157, 037	Hanes Corp. v. London-Aire Inc.	S D Fla. Doc 71-1379	VI-Inj	Dec. 20, 1971	
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3, 157, 431	Fletcher v. Mohasco Ind.	N.D. Ill. Doc. 67 C739.	CJ	Feb. 29, 1968	
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3, 158, 142	Bradshaw v. General Motors Corp.	E.D. Mich. Doc 28633	DM WO/P	June 4, 1968	
3, 158, 424	Bunker-Ramo Corp. v. ITT Corp.	N.D. Ill. Doc. 72 C 653.	DM (Vol)	May 31, 1972	
3, 158, 803	Sinclair Oil & Gas Co. v. Union Oil Co. of California.	S.D.N.Y. Doc 68 C3261.	DM	Aug. 10, 1970	
3, 158, 803	Hiroca Corp. v. Union Oil Co. of California et al.	S.D.N.Y. Doc. 68C3412.	DM	Aug. 10, 1970	
3, 159, 316	Valve Corp. of America v. Diamond International Corp. et al.	N.D. Ill. Doc. 67 C2120.	DM	Nov. 12, 1968	
3, 159, 501	Ampex Corp. v. Matsushita Elec. Corp. of America.	N.D. Ill. Doc. 67 C2023.	DM	June 26, 1969	
3, 160, 321	Eagle Iron Works v. Barber-Greene Co.	N.D. Ill. Doc. 69C848	Inj	Feb. 27, 1969	
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3, 161, 051	Cherry-Burrell Corp. v. Wizard Gauge.	W.D.N.C. Doc. 2140- C.	DM	Apr. 18, 1968	
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3, 161, 223	Tapco Products Co. v. Van Mark Products Corp.	E.D. Mich. Doc. 31627 171 PQ 675.	Inj. Modified V.	Oct. 21, 1971	
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3, 161, 471	Norton v. Carborundum Co.	W.D.N.Y. Doc. Civ. 1967 422.	DM	Mar. 5, 1969	
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3, 161, 908	Monteray Mfg. Co. v. Hartzell Mfg. Co. et al.	N.D. In. Doc. 70C 2804.	Dm	Mar. 7, 1972	
3, 161, 993	Sweco, Inc. v. Roto-Finish Co.	C.D. Calif. Doc. 68- 1661.	Stip Dm w/p..	Sept. 12, 1969	
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3, 162, 323	Dole Valve Co. v. Perfection Bar Equipment Inc.	C.A. 7th Cir. #17426 164 PQ 65.	NV-NI Aff	Dec. 11, 1969	
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3, 162, 387	Nordberg Manufacturing Co. v. Barber-Greene Co.	N.D. Illinois Doc. 66 C 67.	wo/p.	Jan. 19, 1970	
3, 162, 705	Crown Machine & Tool Co. v. D & S Industries.	C.A. 9 160 PQ 584	Cl. 1 NV	Feb. 13, 1969	B of A.

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3, 163, 756	Nuclear Chicago Corp. v. Packard Instrument Co., Inc.	N.D. Ill. Doc. 65 C916.	DM.....	Apr. 1, 1968	
3, 164, 933	Diamond Productions et al v. Assoc. Diamond Products, Inc.	D. N.J. 321-70.....	Dm.....	Aug. 25, 1971	
3, 165, 031	Edward A. Rockwell et al v. Midland Ross Corp.	N.D. Ill. Doc. 66 C202.	Dm w/p.....	Sept. 23, 1969	
3, 165, 369	Bunker Ramo Corp. v. ITT Corp.	N.D. Ill. Doc. 72 C653.	Dm.....	May 31, 1972	
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3, 166, 112	Perfect Mfg. Inc. v. Glen Mfg. Inc.	S.D.N.Y. Doc 68 Civ 3249.	Dm.....	Aug 14, 1972	
3, 166, 154	Titzel Engineering Co., Inc. v. M & G Industrial Association.	W.D. Pa. Doc. 70- 1333.	I.....	Oct. 15, 1971	
3, 166, 693	Transistor Electronics Inc. v. Western Electric Co., Inc.	S.D.N.Y. 70 Civ 765..	Dm.....	Feb. 27, 1970	
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3, 169, 612	Frantz Manufacturing Co. v. Phenix Mfg. Co., Inc.	E.D. Wisc. Doc. 67- C-335 164 USPQ 381.	NV.....	Jan. 20, 1970	
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3, 170, 086	Sinclair Oil & Gas Co. v. Union Oil Co. of Calif.	S.D.N.Y. Doc. 68 Civ. 3261.	Dm.....	Aug. 10, 1970	
3, 170, 086	Hiroca Corp. v. Union Oil Co. of Calif. et al.	S.D.N.Y. Doc. 68 Civ. 3412.	Dm.....	Aug. 10, 1970	
3, 170, 275	Packaging Ind. Ltd., Inc. v. Diemetic Mfg. Corp.	S.D.N.Y. Doc 65C2007.	Dm w/p.....	July 17, 1968	
3, 170, 275	Packaging Ind. Ltd., Inc. v. Accurate Steel Rule Die Mfgs. Inc.	S.D.N.Y. Doc. 65 Civ. 1617.	Stip discon- tinued.	Mar. 11, 1970	
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3, 171, 016	Sukala v. Phillips Mfg. Co.	D. Minn. 4-66/30....	Dm.....	June 13, 1968	
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3, 171, 652	Diversified Products Corp. et al. v. Sports Center Co., Inc. et al.	D. Md. Doc. #16848 160 USPQ 458	NV.....	Mar. 12, 1968	
3, 171, 700	Ever-Wear, Inc. v. Wieboldt Stores, Inc.	427 F. 2d 373 166 USPQ 109 CA7	Affirmed NV..	June 9, 1970	
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3, 171, 700	Ever-Wear, Inc. v. Atlantic Luggage Mfg. Co.	S.D.N.Y. Doc. 67 Cir. 5089	Dm w/p.....	July 22, 1970	
3, 172, 289	Blackman et al. v. Hadron, Inc.	E.D. N.Y. Doc. 69C595	Dm.....	Feb. 7, 1972	
3, 172, 429	Lundstrom Laboratories, Inc. v. Hardwood Manufacturing Co., Inc.	W.D. North Car. Doc. *2282	Dm NI w/o/p..	Sept. 9, 1969	
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3, 173, 583	Wahl et al. v. Chemical Construction Corp. et al.	Dn. J. Doc. 817-71	Dm-----	Jan. 12, 1972	
3, 173, 723	Southeastern Metals Co., Inc. v. American Seating Co.	N.D. Ala. Doc. CA65-388-S	V-NI-----	Jan. 31, 1968	
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3, 173, 937	The Ansul Co. v. Vineland Chemical Co. Inc. et al.	D.N.J. Doc. 346-68	Dm wo/p-----	Aug. 3, 1970	
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3, 174, 869	Vac-U-Dry Co. v. Treetop Inc., et al.	D.E. Wash. #3255	Dm w/p-----	June 10, 1971	
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3, 719, 836	Columbia Broadcasting System v. Sylvania Electric Products, Inc.	U.S. CA 1st Cir. 162 PQ 577.	J Vacated---	July 30, 1969	
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3, 182, 136	Sonotone Corp. v. Rivertone Co. Inc.	S.D.N.Y. Doc. 68 Cir. 3863.	Dm w/p-----	Jan. 7, 1970	
3, 184, 169	Metallurgical International Inc. v. Kawecki Berylo Ind., Inc.	E.D. Pa. 175 USPQ 492.	C1. 1-7-NV---	Sept. 14, 1972	
3, 184, 314	International Stock Food Corp. v. M & M Livestock.	N.D. Iowa 70C 2039C.	C1. 3-NI CJ & I-----	May 15, 1971	
3, 184, 596	James R. Alburger v. North American Aviation, Inc. et al.	d65-885-FW C.D. Calif.	NV, NI-----	May 14, 1969	
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3, 187, 251	Sinclair Oil & Gas Co. v. Union Oil Co. of California.	d68 Cir 3261 S.D.N.Y.	Dm-----	Aug. 10, 1970	
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3, 188, 665	Snyder Paper Corp. v. Dixie Foam Rubber.	d553 W.D.N.C.	Inj-----	June 3, 1968	
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3, 191, 801	Miner Industries Inc., v. Northwester Sales & Service Corp.	d69 CIV2235 S.D.N.Y.	Inj.	Aug. 6, 1969	
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3, 193, 300	Scott USA Inc. v. McDonald.	167 PQ 526 S.D. Idaho	NV	Apr. 22, 1970	B of A.
3, 194, 032	Ski Pole Specialists v. McDonald.	167PQ 519	J. Vacated	June 26, 1969	B of A.
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3, 194, 883	Printing Developments, Inc. v. RCA Corp.	d69-2290 S.D.N.Y.	Dm.	July 6, 1970	
3, 195, 197	American Optical Corp. v. Coburn Optical Equipment Co., et al.	d67C2049 N.D. Ill.	V & I	June 4, 1969	
3, 196, 122	Master Mechanics Co. v. Cleveland Marble Mosaic Co.	dC67-726 N.D. Ohio	I	Dec. 21, 1972	
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3, 197, 299	Hercules, Inc. v. Minnesota State Highway Department.	d4-71 D.C. Minn.	I	Feb. 14, 1972	
3, 197, 204	Exer-Genie, Inc. v. McDonald et al.	171 USPQ 277 CA9	NV Rev.	Sept. 14, 1971	
3, 197, 204	Exer-Genie, et al. v. Alexander G. McDonald et al.	d68-751-IH.	V, Inj.	Sept. 24, 1968	
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3, 198, 383	Brown v. Montgomery Ward.	4987-A	Consent J. NV.	Mar. 30, 1971	
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3, 199, 226	Chester Electronic Laboratories, Inc. v. Continuous Progress Education, et al.	d11482 D. Conn.	Dm.	Feb. 5, 1969	
3, 199, 236	Waldon Inc. v. Alexander Mfg. Co. et al.	d1165 161 PQ 404 S.D. Mo.	V	Feb. 7, 1969	
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3, 200, 945	Hughes Co., Inc. v. Chisholm-Ryder Co., Inc.	164PQ138	NV, NI	July 30, 1969	
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3, 200, 945	Chisholm-Ryder Co. et al. v. Stokely-Van Camp, Inc.	164PQ194	NV, NI	July 30, 1969	
3, 201, 639	North American Phillips Co., Inc. v. Stewart Engineering Co., et al.	166PQ477	V, I	July 10, 1970	
3, 201, 784	Industrial Electronics Engineering v. Shelly Assoc., Inc.	66-75-CC D.S.D. Colo.	DM, W/P	May 1, 1972	
3, 201, 960	Kason Hardward Corporation v. Instrument Systems Corp.	69-C-546 E.D.N.Y.	Inj	Nov. 23, 1970	
3, 202, 532	International Paper Box Machine Co. et al. v. Specialty Automatic Corp.	160PQ466	V, NI	Dec. 6, 1968	
3, 202, 532	International Paper Box Machine Co. et al. v. Specialty Automatic Machine Corp. et al.	163PQ449 CA 1	V, NI Aff.	Aug. 1, 1969	
3, 203, 002	Kelly Co., Inc. v. Unarco Industries, Inc.	3809 D.M. Tenn.	V, I	Dec. 12, 1968	
3, 203, 638	Cutting Room Appliances Corp. v. Sam Zuckerman Sewing Machine Corp.	68 Civ 278 S.D.N.Y.	DM	May 26, 1970	
3, 204, 646	Chamberlin v. Solo Products Corp.	67 CIV 1707 S.D.N.Y.	DM/WP	Oct. 17, 1969	
3, 205, 708	Lear Siegler v. Intercontinental Dynamics.	891-70 D.N.J.	DM	Jan. 5, 1971	

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3, 205, 995	Marlan Co. v. Perma-Vending Corp.	66-C-1134 D.N. III.	V. CJ, INJ.	May 28, 1968	
3, 206, 028	Fraser v. Continental Corp. et al.	3003 D.C.S.D. W. Va.	NI	Sept. 22, 1972	
3, 209, 228	Skil Corp. v. Sears Roebuck & Co., and Cutler-Hammer, Inc.	66-C-267 N.D. III.	NV	June 28, 1968	
3, 209, 228	Skil Corp. v. Cutler-Hammer, Inc.	162PQ132 CA 7	V Rev.	June 12, 1969	
3, 209, 647	GAF Corp. v. Berkey Photo et al.	68-C-2345 D.N.D. III.	DM	Sept. 20, 1971	
3, 209, 647	GAF Corp. v. Hanimex Corp. et al.	68-C-1121 D.N. III.	SJ, Denied	Apr. 22, 1970	
3, 209, 647	GAF Corp. v. Hanimex Corp. et al.	68-C-2345 D.N. III.	SJ, Denied	Apr. 22, 1970	
3, 210, 767	University of Illinois Foundation v. Gavin.	67-C-730 D.N. III.	DM	Oct. 3, 1968	
3, 210, 767	University of Illinois Foundation v. Winegard Co.	159PQ129 CA 8	NV Aff.	Sept. 30, 1968	
3, 210, 767	University of Illinois Foundation v. Blonder-Tongue, Inc.	164PQ545 CA 7	V.I. Aff.	Feb. 13, 1970	
3, 210, 767	Blonder-Tongue, Inc. v. University of Illinois Foundation	169PQ513 Sup. Ct.	J Vacated	May 3, 1971	
3, 210, 767	University of Illinois Foundation v. Blonder-Tongue, Inc.	171PQ468	c.e.	Sept. 27, 1971	
3, 210, 677	University of Illinois Foundation v. Blonder-Tongue, Inc.	175PQ1 CA 7	c.e. Aff.	July 25, 1972	
3, 210, 835	Rheem Mfg. Co. v. Strato Tool Corp.	C-1169-66 D.N.J.	DM	Aug. 22, 1968	
3, 211, 211	R. L. Russ & Co., Inc. v. Schmidt Machine Co. et al.	C-69-46 D.N. Ohio	Inj.	Mar. 20, 1969	
3, 211, 312	State Bank of Annawan v. Rendispos.	173PQ136	V, I	Sept. 21, 1971	
3, 212, 062	Telecredit, Inc. v. Credit Bureau of Cook County, Inc.	69-C-807 N.D. III.	DM	May 27, 1969	
3, 212, 062	Telecredit, Inc. v. Insta-Check, Inc.	69-C-806 D.N.D. III.	DM	May 13, 1971	
3, 212, 166	Neebars, Inc. v. Long Bar Grinding, Inc. et al.	68-1519-R D.C. Calif.	CJ, INJ.	Apr. 11, 1969	
3, 212, 909	Leigh v. Karaman	69 Civ. 282S. D.N.Y.	DM	Nov. 14, 1969	
3, 213, 307	Skil Corp. v. Sears Roebuck & Co. et al.	66-C-267 D.N. III.	J. for Pltff	June 27, 1968	
3, 213, 537	Cavitron Corp. v. Ultrasonic Research Corp.	161PQ518	V, I INJ.	Mar. 17, 1969	
3, 213, 537	Cavitron Corp. v. Ultrasonic Research Corp.	165PQ754 CA 5	V, I Aff.	May 25, 1970	
3, 213, 657	Federal Engineering Co., Inc. et al. v. Darnell & Diebolt Co.	28066 D.S. Mich.	DM, W/P	Apr. 11, 1969	
3, 214, 844	Midland-Ross v. Krispy Kist Korn Mach. Co.	70-C-232 D.N. III.	DM	Apr. 23, 1971	
3, 214, 899	Eastman Kodak Co. v. Indian Head, Inc.	71-345 D.N.D. Ala.	DM, wo/p	Dec. 8, 1971	
3, 216, 038	Keystone Plastics, Inv. v. C & P Plastics, Inc.	173PQ395	NV, NI	Mar. 14, 1972	
3, 216, 060	Oceana Int., Inc. v. Emsig Mfg. Co.	66-C-446 S.D.N.Y.	DM	June 13, 1968	
3, 216, 083	Acker Ind. et al. v. American Rand Expanded Metals Corp.	67-331-C D.W. Okla.	J	Jan. 22, 1968	
3, 216, 473	Proctor-Silex Inc. v. Hamilton Cosco, Inc.	68 Civ. 4983 S.D. N.Y.	DM	Feb. 26, 1970	
3, 216, 624	Valve Corporation of America v. Diamond International Corp.	67-C-2120 N.D. III.	DM	Nov. 12, 1968	
3, 216, 689	Oglebay Norton Co. v. Universal Refractories Corp.	162PQ346	V	June 11, 1969	
3, 217, 648	Remington Arms Company v. Herter's, Inc.	169PQ805	NV, NI	Sept. 16, 1970	
3, 218, 589	Tarzian, Inc. v. Standard Kollsman Industries, Inc.	68-C-80 N.D. III.	DM	Jan. 14, 1969	
3, 219, 099	Hamlow et al. v. Scientific Glass Apparatus Corp. et al.	66-1957-R C.D. Calif.	NV, NI	Jan. 8, 1968	
3, 219, 099	Hamlow et al. v. Scientific Glass Apparatus Corp., et al.	164PQ340	NV	Jan. 22, 1970	
3, 219, 207	Triax Co. v. Hartman Metal Fabri- cators.	Civ. 11-860 D.W. N.Y.	DM	Jan. 16, 1971	
3, 219, 276	The Gryomet Corporation v. H. G. Fisher & Co.	167PQ326	V, I, INJ.	June 3, 1970	
3, 219, 276	H. G. Fischer & Company v. Gyromat Corporation et al.	68-C-1041 D.N. III.	DM	Sept. 13, 1968	
3, 219, 752	Columbia Wire Products v. Markal Sales Corp.	67-C-636 N.D. III.	DM	Apr. 10, 1968	
3, 219, 752	Columbia Wire Products Co. v. Vikua, Inc.	1212-67 D.N.J.	SJ	June 12, 1969	
3, 220, 522	Thomas G. Carter, Jr. v. D & J Gear Co.	3-3587C N.D. Tex.	V, INJ.	Sept. 29, 1971	
3, 220, 960	Griffith Lab. v. National Patent De- velopment Corp.	1971-212 W.D.N.Y.	DM	May 14, 1971	
3, 220, 857	American Potato Co. v. General Foods Corp.	3813 D. Del.	DM	Oct. 20, 1971	
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3, 221, 616	Josam Manufacturing Company v. Jay R. Smith Mfg. Co.	1245-66 D.N.J.	CJ, INJ.	Mar. 29, 1968	

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3, 222, 172	CBS v. Sylvania Electric Products	160PQ470	V, I.....	Dec. 23, 1968	
3, 222, 172	Columbia Broadcasting System v. Sylvania Electric Products, Inc.	162PQ577 CA1.....	J, vacated.....	July 30, 1969	
3, 222, 204	Cataphote Corporation v. Minnesota Mining & Mfg. Co.	3-68 CIV 281 D. Minn.	DM.....	Feb. 19, 1969	
3, 222, 935	Hollymitic Corporation v. RMC Corp..	Civ 67-123-D E.D. Ill.	DM-W/P.....	Feb. 6, 1968	
3, 223, 070	Ag. Pro. Inc. v. Sakraida.....	168PQ481 CA5.....	Rev. SJ/NV.....	Feb. 1, 1971	
3, 224, 201	Brunton Corporation v. Ennric Com- pany, Inc.	49212 DC N.D Calif.	CJ, INJ.....	Nov. 5, 1969	
3, 224, 478	Lundstrom Laboratories, Inc., v. Hardwood Mfg. Co., Inc.	2282 W.D.N.C.....	DM, NI W/P.....	Sept. 9, 1969	
3, 224, 675	Purex Corporation Limited v. Thermo- Pak Boilers, Inc.	C-69-22 W.D. Tenn.	V, I, INJ.....	Mar. 19, 1970	
3, 225, 305	Beckman Instrument v. Technical Development Corp.	167PQ10 CA-7.....	Rev. S.J.....	Sept. 4, 1970	
3, 225, 305	Beckman Instruments, Inc. v. Tech- nical Development Corp.	66-C-1710 N.D. Ill.	SJ, DM o/w p.	May 20, 1969	
3, 226, 916	Judson B. Jenkins v. Well Control, Inc.	69-H-298 S.D. Tex.	DM w/p.....	Aug. 8, 1969	
3, 226, 953	Good et al. v. Dane Baer Hosiery Mill.	626 W.D.N.C.	CJ, I.....	May 21, 1971	
3, 227, 158	Aquec Tec Corporation v. Montgom- ery Ward & Co., Inc.	66-C-550 D. Colo.	CJ.....	July 24, 1967	
3, 227, 193	Sarkes Tarzian, Inc. v. Standard Kollsman Industries, Inc.	69-C-80 N.D. Ill.	DM.....	Jan. 14, 1969	
3, 227, 273	Compact Industries, Inc. v. Inter- continental Coffee Service, Inc.	69-C-788 N.D. Ill.	DM.....	May 8, 1969	
3, 227, 321	Valve Corporation of America v. Union Carbide Corporation.	67-Civ-2051 S.D.N.Y.	DM.....	Mar. 20, 1970	
3, 227, 358	C-Thru Products, Inc. v. Uniflex, Inc.	158PQ433 CA 2.....	NV, affirmed.....	July 10, 1968	
3, 227, 358	Windmoller v. Laguerre.....	159PQ24.....	NV.....	May 3, 1968	
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3, 227, 604	Morgan Adhesive Company v. Nation- wide Adhesive Products, Inc.	C-66-373 DC N.D. Ohio.	DM.....	Nov. 10, 1969	
3, 227, 981	Sarkes Tarzian Inc. v. Standard Kollsman Industries, Inc.	69-C-80 N.D. Ill.	DM.....	Jan. 14, 1969	
3, 228, 413	Mack Johnston, Inc., et al. v. Frank- lyn R. Hoff et al.	12100 D. Conn.	DM W/P.....	Aug. 5, 1970	
3, 229, 083	Shelly Assoc., Inc. v. Chicago Minia- ture Lamp, Co.	170PQ315.....	NI.....	Jan. 20, 1971	
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3, 229, 237	N.A. Philips Corp. v. LTV Electrosys- tems, Inc.	69-F-39 N.D. Ind.	J for P, INJ..	June 1, 1970	
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3, 229, 543	Kenner Products v. Bross et al.....	1728-70 D.N.J.....	DM.....	Mar. 26, 1971	
3, 229, 880	Artag Plastics Corporation v. Patents Dev. Quorum.	69-C-1360 N.D. Ill.	J. DM W/P.....	Oct. 8, 1971	
3, 229, 932	Raven Industries v. Piccard.....	70-2841 C.D. Calif.	DM WO/P.....	Jan. 24, 1972	
3, 230, 675	Dubuque Awning & Tent Co. v. W. B. McQuire.	69 CIV 265 N.D.N.Y.	DM W/P.....	Sept. 16, 1971	
3, 230, 720	Allied Steel & Tractor Products, Inc. v. Robinson Clay Product Co., et al..	C66-346 N.D. Ohio...	DM.....	July 31, 1969	
3, 231, 503	Philip A. Hunt Chemical Corporation v. MacDermid, Inc.	11481 D. Conn.	V.....	May 21, 1968	
3, 231, 784	Major Corporation v. Hub Electric Company, Inc.	68-C-2344 N.D. Ill.	DM WO/P.....	Jan. 6, 1970	
3, 231, 945	Malleable Iron Fittings Company v. Barron Bethen Co., Inc.	CA67-279-S N.D. Ala.	NV.....	June 24, 1968	
3, 233, 170	Homco International, Inc. v. Gearhart- Owen Industries, Inc., et al.	CA4-1936 N.D. Tex.	CJ, I.....	May 15, 1972	
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3, 233, 557	Perfecto, Inc. v. Heinicke Instrument Co.	66-178-CIVTC S.D. Fla.	DM w/p.....	Mar. 5, 1970	
3, 234, 810	Harry Orner v. Scully-Jones Co.....	69-C-1693 N.D. Ill.	DM w/p.....	Feb. 19, 1970	
3, 235, 688	General Electric Co. v. Westinghouse Electric Corp.	3600 D. Del.	DM wo/p.....	Dec. 30, 1968	
3, 236, 018	Tate Engineering Co. v. United States.	175PQ115.....	NI.....	Aug. 1, 1972	
3, 236, 163	Blaw-Knox Co., v. Barber-Greene Co.	176PQ214.....	NV, I if v, F- Misrep. of art.	July 28, 1972	
3, 236, 289	Guy E. Dixon et al. v. Alexander Ber- nard Builders.	66-1087-Civ-TC-S. Fla.	VI.....	Feb. 26, 1969	
3, 236, 390	Blohm & Voss AG v. Grace Line, Inc...	174 USPQ 484 D.C. Md.	V, I.....	Nov. 13, 1972	
3, 236, 762	Union Carbide v. Filtrol Corp.....	170 PQ 482 D.C. Calif.	VI.....	Apr. 29, 1971	
3, 236, 956	Sonotone Corp. v. Rivertone Co., Inc..	SDNY DN 68 Civ. 3863	Dm w/p.....	Jan 7, 1970	
3, 237, 436	Supra Products, Inc. v. Joseph Maertz et al.	68 1531 WPG D.C. Calif.	V, Inj.....	June 11, 1969	
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3, 239, 607	Plastic Ward, Inc. v. Superior Plas- tics, Inc.	67 C 2174 D.N. III	Misrep. of art VI	May 3, 1971 Dec. 17, 1968	
3, 240, 026	Gordon Johnson Co., et al. v. Ralph S. Zebarth et al.	16336-4 D.W. Mo	I, Inj	Jan. 20, 1969	
3, 240, 246	Proctor-Silex Inc. v. Hamilton Cosco, Inc.	d 68 Civ. 4983 SDNY.	Dm wo/p	Feb. 26, 1970	
3, 241, 225	Sherburne Corp. v. Ohio Spring Specialties.	C69-70 D.C. N.D.	Inj	Nov. 3, 1971	
3, 241, 429	PID Corp. v. R.R. Donnelley & Sons Co. et al.	d66C1654 N.D. III	Dm, w/op	Feb. 24, 1969	
3, 243, 098	St. Regis Paper Co. v. Container Corp. of America.	d68 Civ. 1958 S.D.N.Y.	Dm	Sep. 19, 1969	
3, 243, 128	Morehouse-Cowles, Inc. v. Schold Welding & Machine Co. (Inc.)	d68C1117 D.N. III	Dm, wo/p	Mar. 6, 1970	
3, 243, 272	General Steel Inc. v. Corning Glass Works.	67-176-Civil E.D. Okla.	Dm	Mar. 2, 1971	
3, 243, 307	Pile Council v. Chicago Mastec	69C2242 N.D. III	VI	Apr. 12, 1971	
3, 243, 567	Elox, Inc. v. Astral Prec. Equip. Co.	d69C2590 N.D. III	CJ, I	May 2, 1972	
3, 243, 625	Gen. Tel. & Electronics Lab. Inc. v. National Video Corp. et al.	68C587 D.N. III	Dm, w/p	May 12, 1970	
3, 243, 914	Poynter Products Inc. et al. v. Allied Stores Corp. et al.	d66 Civ 3384 S.D. N.Y.	Inj	May 14, 1969	
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3, 244, 782	Magnetic, Inc. Arnold Engineering Co., et al.	163 PQ 513 D.N. III	NV	Aug. 28, 1969	
3, 244, 782	Magnetic, v. Arnold Engineering Co.	168 PQ 392 CA7	NV, Aff	Jan. 9, 1971	
3, 245, 719	Pacific Int'l Plastics et al. v. Sterling Plastics Corp., et al.	d67-1352 FW C.D. Calif.	NV	Sep. 16, 1969	
3, 245, 727	Goodyear Tire v. Crane Co.	165 USPQ 35			
3, 245, 840	Metal Blast, Inc. v. Steel Abrasives Inc.	67C1972 N.D. III d6306 D.S. Ohio	Dm, w/op Dm	June 8, 1970 Jan. 15, 1971	
3, 246, 336	Staley Mfg. Co. v. Harvest Brand Inc.	KC-2588 D.C. Kans.	NV	Oct. 13, 1970	
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3, 246, 979	General Electric Co. Westinghouse Elec. Co.	1971-452 D.W.D. N.Y.	Dm	July 6, 1972	
3, 247, 524	World Industries Inc. v. Richo Plastic Co. et al.	68C 1779 D.N. III	Dsm w/p	June 4, 1970	
3, 247, 747	Mueller Brass Co. v. Reading Ind. Inc.	176 USPQ 361	NV	Dec. 22, 1972	
3, 247, 757	Advanced Product Dev. v. John Plain & Co.	70 C 2292 D.N. III	Dm wo/p	June 9, 1971	
3, 249, 001	Honeywell Inc. v. GAF Corp. et al.	68 C 1159 D.N.D. III	Dm	Oct. 27, 1971	
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	Honeywell Inc. et al. v. A.I.C. Photo Inc. et al.	69 C 1593 D.N. III	Dm	Apr. 21, 1970	
3, 249, 270	Mr. Hanger, Inc. v. Yankee Plastics, Inc.	67 CIV 1060 D.S.N.Y.	CJ, Inj	Feb. 14, 1969	
	Mr. Hanger, Inc. v. Apparel Plastics	68-957-CIV JE D.S. Fla.	V & I Inj	Mar. 17, 1971	
3, 251, 016	American Plasticraft Co. v. Gottlieb	68 C 2050 D.N. III	Dm	Feb. 24, 1969	
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3, 251, 234	Alps Electric Co. et al. v. Sarkes Tarzi- an Inc.	70 C 1857 D.N.J.	Dm w/p	Mar. 26, 1971	
3, 251, 381	Polymer Corp. v. I.T.E. Imperial Corp.	68 C 1571 D.N. III	Dm	Oct. 24, 1968	
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3, 251, 551	H. G. Fischer & Co. v. Gyromat Corp. et al.	68 C 1041 N.D. III 167 USPQ326	NV N/I	June 3, 1970	
3, 252, 081	Sinclair Oil & Gas Co. v. Union Oil Co. of Calif.	68 CIV 3261 D.S.N.Y.	Dm	Aug. 10, 1970	
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3, 352, 582	Green Valley Prod. Inc. v. General Tire & Rubber Co.	67-3307 S.D.N.Y.	Dm w/p	Apr. 5, 1972	
3, 252, 733	Ashe Co. Inc. v. Bridgeport Metal Goods Mfg. Co.	66 CIV 3296 D.S.N.Y.	Dm	Apr. 26, 1968	
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3, 255, 327	Teledyne v. C. P. Clare & Co.	70 C 2224	Dm wo/p	May 26, 1971	
3, 255, 500	Ashland Oil & Refining Co. v. Combustion Engineering, Inc.	3830 D. Del.	Dm wo/p	Apr. 16, 1970	
3, 255, 722	S. A. Hirsch Man. Co. v. Quaker Industries Inc.	69 C 1361 D.N. Ill.	Dm wo/p	Jan. 23, 1970	
3, 256, 500	Sinclair Oil & Co. v. Union Oil Co. of Calif.	68 Civ 3261 D.S.N.Y.	Dm	Aug. 10, 1970	
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3, 256, 968	Micro-Magnetic Ind. Inc. v. Advance Automatic Sales Co. Inc.	175 USPQ 331 D.N.C. Cal.	NV, NI	July 17, 1972	
3, 257, 230	Chromaloy Am. Corp. v. Alloy Surfaces Co.	173 USPQ 295, 175 USPQ 148	NV, F	Mar. 14, 1972	
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3, 257, 332	Ziegler v. Phillips Petroleum Co.	171 USPQ 44 N. Texas	V, NI	June 23, 1971	
3, 257, 580	Elox Inc. v. Astral Prec. Equip. Co.	69 C 2590 N.D. Ill.	CJ, Def. I	May 2, 1972	
3, 257, 608	Sinclair Oil Gas Co. v. Union Oil Co. of Calif.	68 Civ 3261 D.S.N.Y.	Dsm	Aug. 10, 1970	
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3, 259, 529	Metal Blast Inc. v. Steel Abrasives Inc. et al.	6306 S.D. Ohio	Dm	Oct. 15, 1971	
3, 259, 904	U. of Ill. v. Blonder Tongue Lab. v. J.F.D. Electronics.	66 C 567 N.D. Ill.	NV	Sept. 27, 1971	
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3, 259, 948	Howmet Corp. v. Precision Cast Posts Corp.	72-168 D. Oreg.	Dm	Dec. 21, 1971	
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3, 260, 025	Fraser v. City of Antonio, Texas and Agents et al.	67-85 SA W. Texas	NV, NI	June 30, 1969	
3, 260, 190	Levinson v. Nordskog Co. Inc.	163 USPQ 52 D.C. Calif.	NV	July 7, 1969	
3, 260, 508	Zimmerman Mfg. Inc. v. Hash Co. Inc.	38085 E.D. Mich.	Dm	Oct. 19, 1972	
3, 262, 378	Hussman Refrig. Co. v. Hilman Coal & Coke.	4002 D. Del.	CJ, V & I	Apr. 19, 1971	
3, 262, 626	Sweetheart Plastics v. III. Tool Works Inc.	CA 70-937F D. Mass.	Dm w/op	July 28, 1971	
3, 263, 161	Sinclair Oil & Gas Co. v. Union Oil Co. of Calif.	68 Civ 3261 D.S.N.Y.	Dm	Aug. 10, 1970	
	Hiroca Corp. v. Union Oil Co. of Calif. et al.	68 Civ 3412 D.S.N.Y.	Dm	Aug. 10, 1970	
3, 263, 341	Mira-Pak Inc. v. Woodman Co.	15788 N.D. Ga.	Settled Dm	Jan. 24, 1972	
3, 263, 558	GAF Corp. v. Berkey Photo et al.	68 C 2345 N.D. Ill.	Dm	Sept. 20, 1971	
3, 263, 757	Paul G. Kaster v. Kastern Mfg. Co.	68 C 12 D.E. Wis.	Def. enj.	Jan. 22, 1968	
3, 263, 899	St. Regis Paper Co. v. Container Corp. of America.	68 Civ 1958 D.S.N.Y.	Dm	Sept. 19, 1969	
3, 264, 882	Koytt Nichols v. Schlumberger Well Surveying Corp. et al.	W-4076 D. Kans.	Dm w/p	Nov. 24, 1969	
3, 265, 092	Fluorodynamics Inc. v. Permatube Plastics Co.	4161 D. Del.	Dm w/op	Feb. 2, 1972	
	Permatube Plastics Inc. v. Fluorotex Inc.	4318 D. Del.	Dm w/op	Apr. 6, 1972	
3, 265, 103	Hervey Foundation et al. v. Capitol Machine Co.	IP 69 C 349 S. Ind.	SJ, NV	July 6, 1971	
3, 265, 290	Cali. v. Eastern Airlines Inc.	167 USPQ 399 D.E. N.Y.	NV	July 10, 1970	
	Cali. v. Eastern Airlines Inc.	169 USPQ 753 C.A. 2	V (rev. D. Ct.)	Apr. 28, 1971	
3, 266, 015	Pickering v. Holman et al.	173 USPQ 583 C.A. 9	NV AFF	Apr. 18, 1972	
3, 266, 173	Aetna Casualty & Surety Co. v. Singer-General Precision Inc.	4231 D. Del.	Stip. Settle. Dm.	June 21, 1972	
3, 266, 301	J. Sklar Mfg. Co. Inc. v. Matalene Surgical Instruments Co., Inc. et al.	67 Civ 2144 D.S.N.Y.	Inj	Mar. 18, 1970	
3, 266, 384	Scaramucci et al. v. Dresser Ind. Inc.	66-347 D.W. Okla.	NV, NI	Jan. 30, 1969	

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3, 266, 386	Scaramucci v. Dresser Industries Inc.	165 USPQ 759 CA10	NV, NJ AFF	June 5, 1970	B of I.
	Scaramucci et al. v. Dresser Industries Inc.	66-347 D.W. Okla.	NV, NJ	Jan. 30, 1969	
3, 267, 360	Scaramucci v. Dresser Industries Inc.	165 USPQ 759 CA10	NV, NJ AFF	June 5, 1970	B of I.
	Sinclair Oil & Gas Co. v. Union Oil Co. of Calif.	68 Civ 3261 D.S.N.Y.	Dm	Aug. 10, 1970	
	Hiroca Corp. v. Union Oil Co. of Calif. et al.	68 Civ 3412 D.S.N.Y.	Dm	Aug. 10, 1970	
3, 267, 413	Raytheon Co. v. Pearce-Simpson Inc.	69-294 D.S. Fla.	V, I	Dec. 19, 1969	
3, 267, 587	Faberge v. John Oster Mfg. Co.	68 C 84 D.E. Wis.	CJ, V & I	Nov. 27, 1970	
	Sunbeam Corp. v. Faberge, Inc.	3-70 Civ 28 D.C. Minn.	Dm w/p I	Nov. 27, 1970	
3, 267, 630	Rayette-Faberge v. Schick Electric.	3691 D. Del.	CJ, I	Feb. 17, 1971	
	Powerlock Floors v. Robbins Flooring	157 USPQ 669 D. Del. 3262.	NV §103	Feb. 26, 1968	
	Powerlock Floors v. Robbins Flooring Co. Inc.	160 USPQ 165 CA3 17289	NV, §103 AFF	Dec. 17, 1968	
3, 268, 915	Jack Winter Inc. v. Koration Corp.	170 USPQ 316 D.N. Calif.	SJ refused Pat. Ded.	Apr. 12, 1971, Apr. 19, 1971, Apr. 30, 1971	
3, 269, 751	Kendall et al. v. Whattoff et al.	882 O.G. 451 D.C. Iowa	V & I	Oct. 20, 1970	
3, 269, 805	Amp Inc. v. No. American Specialties	70 C 253 D.E.N.Y.	CJ	Mar. 24, 1971	
	Amp Inc. v. S.A.E. Advanced Packaging Inc.	69-579-IH D.C. Calif.	CJ, Dm	June 21, 1969	
3, 269, 877	Detrex Chem. Inc. v. Quality Produc. Co. Inc.	31046 D.E. Mich.	V & I	June 21, 1968	
3, 270, 251	AMP Inc. v. S.A.E. Advanced Packaging Inc.	69-579IH D.C. Calif.	Inj	June 20, 1969	
3, 270, 374	Jeff Mfg. Corp. v. Seabrook, Inc.	C/A 69-2 D.S.C.	Dm	Mar. 17, 1969	
3, 271, 916	Powerlock Floors Inc. v. Robbins Flooring	170 USPQ 569 D. Del.	NV, NJ	May 20, 1971	
	Powerlock Floors Inc. v. Robbins Flooring	174 USPQ 422 CA3, 71-1732	NV, NJ AFF	July 23, 1972	
3, 272, 003	Boeing Co. v. Dentronics, Inc.	940-68 D. N.J.	Inj	Oct. 1, 1969	
3, 273, 222	Kysor Industrial Corp. v. Indexomatic, Inc.	N 37792 D.C.E.D. Mich.	Dm w/p	Dec. 1, 1972	
	Kysor Industrial Corp. v. Supreme Tri Bit.	N 38759 D.C.E.D. Mich.	Dm w/p	Nov. 30, 1972	
3, 273, 632	Air Balance Inc. v. Ruskin Mfg. Co.	17209-4 W.D. Mo.	Def enjoined	July 1, 1969	
3, 274, 906	Edoco Technical Products Inc. v. Peter Kiewit Sons Co.	165 USPQ 207 D.C. Cal.	V, I	Mar. 23, 1970	
	Free Standing Stuffer v. Gen. Dev. Corp.	67 C 1688 D.N. Ill.	V, Inj	Jan. 8, 1968	
	Free Standing Stuffer, Inc. v. Columbia Broadcasting, Inc.	68 C 310 D.N. Ill.	Dm w/p	July 24, 1970	
	Free Standing Stuffer, Inc. v. N.B.C.	70 C 1512 D.N. Ill.	Dm (stip)	Feb. 4, 1971	
	Free Standing Stuffer, Inc. v. Parent's Magazine.	71 C 134 N.D. Ill.	Dm. (stip)	Feb. 3, 1972	
3, 275, 724	Struthers Scientific v. Rappi & Hoenig Co.	Civ 1966-214 D.W.N.Y.	I, Inj	May 20, 1971	
	Struthers Scientific v. Rappi & Hoenig Co.	172 USPQ 257 2d Cir.	NV (rev. D.Ct.)	Jan. 4, 1972	
3, 275, 741	Printing Development Inc. v. RCA Corp.	69-2290 D.S.N.Y.	Dm	July 6, 1970	
3, 277, 770	Wej-It Expansion Products, Inc. v. Longford Tool & Drill Co.	4-67 Civ 8 D. Minn.	Dm	Dec. 15, 1969	B of I.
	Lester Lerich et al v. Allan G. McCulloch.	4-69 Civ 328 D. Minn.	Dm	Dec. 15, 1969	B of I.
3, 277, 881	Arthur G. Bruns v. Benihan Chicago Corp.	68 C 1066 D. N. Ill.	Dm	Jan. 15, 1969	B of I.
3, 278, 364	Dieffenbach v. Tomar Industries Inc.	67 C 1365 D.N. Ill.	Dm	June 16, 1969	
3, 279, 138	Wilson Oak Flooring Co. Inc. v. Cromar Co.	10,146 N. Penna.	I	Mar. 23, 1970	
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3, 279, 793	Marlin Toy Products, Inc. v. Tarrson Co.	67 C 832 D.N. Ill.	Inj	Nov. 27, 1968	
3, 281, 709	Sinclair Oil & Gas Co. v. Union Oil Co. of Calif.	68 Civ 3261 D.S.N.Y.	Dm	Aug. 10, 1970	
3, 282, 057	Hiroca Corp. v. Union Oil Co. of Calif.	68 Civ 3412 D.S.N.Y.	Dm	Aug. 10, 1970	
	Gordon H. Allen et al. v. W. H. Brady Co.	70 C 1426 N. Ill.	J. Memo opinion.	Dec. 26, 1972	
3, 282, 566	Autoquip Corp. v. Lo-Lift Mfg. Corp.	C 68 677 D.N. Ohio.	V, I, Inj	Sept. 2, 1969	
3, 283, 353	Topline Products v. Melard Mfg. Corp.	69 4496 D.S.N.Y.	Dm	June 3, 1971	
3, 283, 419	Art Award Co. Inc. v. Standard Toy-craft Inc.	67 C 143 D.E.N.Y.	Dm	Aug. 26, 1969	
3, 283, 529	King-Seely Thermos Co. v. Borg-Warner Corp.	68 C 1057 N.D. Ill.	Dm w/p	Mar. 31, 1970	
3, 283, 929	State Bank of Annonan v. Rendispas	173 USPQ 136 D.S. Ill.	V&I	Sept. 21, 1971	

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3, 285, 752	Armour & Co. v. Swift & Co.....	168 USPQ 269 N.D. Ill.	NV, NI, F.....	Nov. 27, 1970	
	Armour & Co. v. Swift & Co.....	173 USPQ 70 7th Cir. 71-1197	NV, Aff. Fraud	Aug. 9, 1972	
3, 286, 216	Robert Shaw Controls Co. v. Honeywell Inc.	68 1132-S D.C. Calif.	Dm w/p.....	July 3, 1969	
3, 286, 606	Layton Mfg. Co. v. Ford Lane Equipment.	70 C 607(1) E.D. Mo.	Dm w/p.....	Dec. 13, 1971	
3, 286, 923	Robert Shaw Controls Co. v. Honeywell Inc.	68-1132-S D.C. Calif.	Dm w/p.....	July 3, 1969	
3, 287, 193	Max Klein, Inc., v. L. N. Slaes et al.	29502 E.D. Mich.	Dm w/p.....	Oct. 29, 1969	
3, 287, 750	Snyder Paper Co. v. Dixie Foam Rubber.	553 D.W.N.C.	CJ, I, Inj.....	June 3, 1968	
3, 288, 041	Layton Mfg. Co. v. Ford Lane Equipment Inc.	70 C 607(1) E.D. Mo.	Dm w/p.....	Dec. 13, 1971	
3, 289, 377	Flour City Architectural Metals v. Alpina Aluminum Products, Inc.	172 USPQ 341 CA8..	NV AFF.....	Jan. 13, 1972	
3, 289, 527	Gifford Instrument Laboratories Inc. v. Beckman Instruments, Inc.	69 C 1313 D.N. Ill.	CJ, Dm w/o.....	Sept. 26, 1969	
3, 289, 679	Accelomatic Hair Products Corp. v. Helene Curtis Industries, Inc.	66 C 2248 D.N. Ill.	DM.....	June 16, 1969	
3, 290, 203	3M Co. v. Sup-X International Inc. et al.	70 H 914 S.D. Tex.	CJ, V, I, Inj.....	Nov. 23, 1971	
3, 290, 586	Hewlett Packard Co. v. Tel-Design, Inc.	N.D. Calif.....	C1 1-5, V, II C1 8-11, 15 NV, NI	1971(?)	
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3, 290, 693	American Baseball Cap., Inc. v. Wilson Sporting Goods.	7564 S.D. Ohio.....	NV.....	Feb. 7, 1972	
3, 290, 827	Pang Born Corp. v. Tec Supply Co.	5440 D.E. Tenn.	V, I, Inj.....	July 22, 1969	
3, 291, 417	Lincoln Tool v. Adam Products et al.	70 C 283 E.D. Wis.	Dis.....	June 10, 1971	
3, 292, 615	Boulevard Electronics Inc. v. Marshall Field et al.	67 C 1170 N.D. Ill.	NV.....	Jan. 30, 1971	
3, 293, 094	Congoleum-Nairn Inc. v. New London Mills.	66 Civ 4397 D.S.N.Y.	CJ.....	Dec. 31, 1968	
	Congoleum-Nairn Inc. v. Mannington Mills Inc.	1262-66 D.N.J.....	Dm w/op.....	June 13, 1968	
	Congoleum Industries v. Armstrong Cork Co.	173 USPQ 147 E.D. Pa. 41762.	V, I.....	Feb. 23, 1972	
3, 293, 108	Congoleum-Nairn Inc. v. New London Mills Inc.	66 Civ 4397 D.S.N.Y.	CJ.....	Dec. 31, 1968	
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	Congoleum-Industries Inc. v. Armstrong Cork Co.	173 USPQ 147 41762 E.D. Pa.	V, I.....	Feb. 23, 1972	
3, 294, 277	Block et al. v. Continental Disc Corp.	16752-4 D.W. Mo.	I & Inj.....	Mar. 25, 1970	
3, 294, 296	Neet-A-Pak Products & Precision Papers Inc. v. Efficiency Products Co. Inc. et al.	20255 Civil D. Md.	I, Inj.....	Mar. 13, 1970	
3, 295, 224	Singer-General Precision, Inc. v. Research Corp.	70-4427 S.D.N.Y.	Dm w/p.....	Apr. 17, 1972	
3, 295, 345	Acker Ind. et al. v. Amer. Rand Expanded Metals Corp.	67-331-C D.W. Okla.	J.....	Jan. 22, 1968	
3, 296, 052	Roberts Consol. Ind., Inc. v. Mon-schein.	F-405 E.D. Cal.	Dm (plt).....	July 27, 1970	
3, 296, 056	Roberts Consol. Ind., Inc. v. Mon-schein.	F-405 E.D. Calif.	Dm (plt).....	July 27, 1970	
3, 296, 147	Dow Chemical v. Jack Ferrell et al.	11026 D.S.D. Ga.	Inj.....	Aug. 20, 1969	
3, 297, 155	Ethyl Corp. v. Borden Inc.	163 USPQ 204 D.D. Del.	SJ, I.....	June 26, 1969	
	Ethyl Corp. v. Borden Inc.	166 USPQ 97 CA3d Cir.	Rev., SJ not granted as to I.	June 5, 1970	
3, 297, 215	Enrique Soto et ano v. Frank Friedman & Sons, Inc. et al.	68 Civ 1650 D.S.N.Y.	Inj.....	Nov. 7, 1968	
3, 297, 819	Raychem Corp. v. Conusa Coating Systems Inc.	68 C 2467 D.N. Ill.	Dm.....	June 12, 1970	
3, 297, 831	Pickering & Co. v. Qualitone Indust.	70 CW 4372 D.S.N.Y.	CJ, Inj.....	Dec. 7, 1970	
3, 298, 039	Major Pool Equip. v. Heldon Assoc.	148-71 D.N.J.	CJ, Inj.....	July 27, 1971	
3, 298, 124	Eaton Paper Corp. v. Hudson Photographic Industries, Inc.	67 Civ 3337 D.S.N.Y.	CJ.....	Dec. 6, 1968	
3, 298, 190	The Cornelius Co. et al. v. Beatrice Foods Co. et al.	68 Civ. 221 D.N. Ill.	Dm w/p.....	Dec. 1, 1969	
	Taylor Freezer Div. of Beatrice Foods v. Coca-Cola Bottling Co.	67C2208 69C358 D.N. Ill.	Dm w/p.....	Dec. 1, 1969	
3, 298, 426	Hyman Kramer d/b/a Hy Kramer Enterprises v. Duralife Co. Inc.	67 Civ 2080 D.S.N.Y.	Inj.....	Apr. 14, 1970	

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3, 298, 543	Laidig Silo Unloaders, Inc. v. Nutri Seal Storage Systems, Inc. et al.	10139 Civil D.M. Pa.	Powner of patent.	May 15, 1970	
3, 298, 550	Farmhand, Inc. v. Craven	169 USPQ 811 Civ 68-10N D.S.D.	NI	Mar. 29, 1971	
	Farmhand v. Craven	173 USPQ 1 8th Cir.	DC J rev. Rem., V	Feb. 29, 1972	
3, 299, 558	Anthony Robert Karl v. High Standard Mfg. Corp.	12914 D. Conn.	Dm	Aug. 19, 1969	
3, 299, 681	Hautan & Krsas v. The Pines Engr. Co. Inc.	67 C 1727 D.N. Ill.	Dm w/p	May 15, 1968	
3, 300, 216	Haecck v. Regent Games Inc.	67-C-579 S.D.N.Y.	J for P	Jan. 16, 1968	
3, 300, 576	Hendrix Wire & Cable Corp. v. U.S. Ceramic Tile Co. Inc.	C69-303 N.D. Ohio	DM, wo/p	Mar. 2, 1970	
3, 300, 643	Isotopes Inc. v. Harshaw Chem. Co.	14903 N.D. Ga.	DM	Dec. 20, 1972	
3, 301, 760	Max Factor & Co. v. Del Laboratories Inc.	67Civ2883 S.D.N.Y.	DM	Mar. 4, 1969	
3, 302, 647	Hollister Inc. v. Howmet Corp.	71-406 M.D. Fla.	INJ	Feb. 23, 1972	
3, 302, 653	D'Agostino v. Cadillac Beauty Supply	29937 E.D. Mich.	DM w/p	Mar. 15, 1968	
3, 303, 001	Catalysts & Chem. Inc. v. The Stand- ard Oil Co.	C68-459 N.D. Ohio	DM wo/p	Apr. 20, 1970	
3, 303, 738	Intermountain Research & Engineer- ing Co. Inc. et al v. Hercules Inc.	171USPQ577	NV/NI F	June 15, 1971	
3, 303, 825	Parker Pen Co. v. Waterman-Bic Pen Corp.	68-C-2086 N.D. Ill.	DM w/p	Apr. 25, 1969	
3, 303, 823	General Electric Co. v. Parker Pen Co.	30102 E.D. Mich.	DM w/p	Apr. 22, 1969	
3, 303, 905	Propper Mfg. Co. Inc. v. Misdom- Frank Corp.	856 O.G. 1016	DM	June 6, 1968	
3, 303, 943	H. K. Porter Co. Inc. v. Koppers Co. Inc.	CA68-153 N.D. Ala.	DM	May 13, 1968	
3, 304, 101	Layton Mfg. Co. v. Ford Lane Equip- ment Inc. et al.	706 607(1) E.D. Mo.	DM w/p	Dec. 13, 1971	
3, 304, 106	Automated Bldg. Components v. Trueline Truss.	167PQ89	NI	Apr. 16, 1970	
3, 304, 371	Rosenberg v. Standard Food Process- ing Corp.	171USPQ545	NV	Sept. 14, 1971	
3, 304, 435	Norwood v. Ehrenreich Photo Optical	168PQ72	NV NI	Nov. 23, 1970	
3, 304, 565	California Car Wash Systems, Inc. v. Danco Inc.	175USPQ257	NV	Aug. 4, 1972	
3, 305, 668	Wrap-On Co. Inc. v. Smith	67C576 W.D. Ill.	DM	Jan. 16, 1968	
3, 306, 506	Batts, Inc. v. Mr. Hanger, Inc. et al.	176USPQ388	NV	June 14, 1972	
3, 307, 306	Fabricating Co., Inc. et al v. Adsure, Inc. et al.	161PQ36	NV	Dec. 20, 1968	
3, 307, 363	Henkels & McCoy, Inc. v. Elkin	167USPQ97	NV	Aug. 26, 1970	
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3, 307, 563	Ruth Regina v. Wigs by Dora, Inc. et al.	69-281CivWM S.D. Fla.	INJ	Nov. 19, 1969	
3, 307, 708	Ken Wire & Metal Products Inc. v. CBS, Inc.	172USPQ632	NV	Nov. 23, 1971	
3, 307, 708	Ken Wire & Metal Products Inc. v. CBS, Inc.	175USPQ391CA2	NV Aff.	Sept. 26, 1972	
3, 307, 731	D & S Plug Corp. v. Republic Auto Parts, Inc.	69Civ361 S.D.N.Y.	CJ, INJ	Aug. 20, 1969	
3, 308, 493	Robert Ellis v. Bill Baline	70 16-S S.D. Calif.	SJ	Aug. 18, 1971	
3, 309, 256	Rubin Warsager v. Bristol Brass Corp.	12,746 D. Conn.	DM	May 19, 1970	
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3, 309, 850	Sperry Rand Co. v. Oliver Corp.	69C547 N.D. Ill.	DM	June 15, 1971	
3, 310, 022	Outboard Marine Corp. v. Brunswick Corp.	67C639 N.D. Ill.	DM wo/p	May 28, 1968	
3, 310, 712	Cook Electric Co. v. Reliable Electric Co.	67C1037 N.D. Ill.	CJ/VI	Apr. 24, 1969	
3, 310, 824	Sherman Car Wash Equipment Co. v. Grand Car Wash, Inc.	166USPQ377CA7	I Aff.	July 15, 1970	
3, 310, 824	Sherman Car Wash Equipment Co. v. Grand Car Wash, Inc.	161USPQ619	I	Feb. 18, 1969	
3, 310, 824	Sherman Car Wash Equipment Co. v. Auto Laundry Equipment Sales Co., Inc.	67C1195 N.D. Ill.	DM wo/p	Mar. 8, 1968	
3, 310, 824	Sherman Car Wash Equipment Co. v. John Kamysz d/b/a/ Des Plaines Car Wash.	67C1196 N.D. Ill.	DM wo/p	Mar. 8, 1968	
3, 310, 966	Pilot Research Corp. v. Mar-Clay Mills, Inc.	3580 D. Del.	V	May 28, 1969	
3, 310, 966	Pilot Research Corp. v. S. Klein De- partment Stores, Inc.	68Civ3015 S.D.N.Y.	DM wo/p	Aug. 6, 1969	
3, 311, 990	Empire Level Mfg. Co. et al v. Ace Hardware Corp.	69C1149 N.D. Ill.	DM wo/p	Feb. 18, 1972	
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3, 312, 130	Judel Shon v. Lerner Mfg. Corp.	433-67 DNJ	DM	Sept. 2, 1971	
3, 313, 262	Yunker et al v. Comstock et al.	7173 W.D. Wash.	DM	Apr. 19, 1968	
3, 313, 355	Clary Corp. v. Douglas, Inc. et al.	67C31 N.D. Iowa	CJ, I	Mar. 21, 1972	
3, 313, 443	Globe Linings Inc. et al. v. Revere Plastics, Inc.	171 D.N.J.	CJ, VI	Feb. 16, 1972	
3, 313, 477	Superior Toy & Mfg. Co. v. Montgomery Ward.	69C2520 N.D. Ill.	VI, INJ	June 9, 1970	
3, 313, 477	Superior Toy & Mfg. Co. v. Marcos Inc.	69C2495 N.D. Ill.	VI, INJ	June 9, 1970	
3, 313, 545	PCR Patent Development Corp. v. Chemold Corp.	67-C-656 E.D.N.Y.	DM	Apr. 19, 1968	
3, 313, 854	MMM Co. v. DuPont	171USPQ11 CA7	Estoppel as to assertion of later patent.	Aug. 26, 1971	B of A, B of I, CCPA.
3, 314, 353	James V. Knab et al. v. Walter Kidde & Co.	CA6243 D.W. Mich.	DM	Aug. 19, 1970	
3, 314, 715	Starcraft Co. v. Ski-Tow Mfg. et al.	69597 N.D. Ind.	CJ, I	Feb. 6, 1971	
3, 315, 041	Sidney O. Sampson v. Sony Corp. of America.	67Civ3595 S.D.N.Y.	DM	Jan. 21, 1970	
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3, 315, 320	R. B. Jenkins & Co., Inc. et al. v. Southern Suction and Equipment Company, et al.	2248 W.D.N.C.	CJ, I, INJ	Oct. 3, 1969	
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3, 315, 454	Uxmal Corp. Ltd. v. Wall Industries, Inc. et al.	173PQ253	VI, INJ	Mar. 17, 1972	
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3, 316, 076	Blackman et al. v. Hodson Inc.	69C595 E.D.N.Y.	DM	Feb. 7, 1972	
3, 316, 248	LaSalle St. Press Inc. v. 20th Century Press Inc.	70C584 N.D. Ill.	CJ, INJ	Sept. 27, 1971	
3, 316, 294	Continental Oil v. Witco Chem	70C12 N.D. Ill.	INJ	Nov. 16, 1971	
3, 316, 582	Ridge Products v. Clark's Discount Dept. Store.	4160 N.D. Ind.	DM	Jan. 6, 1970	
3, 317, 926	Hall et al. v. U.S. Fiber & Plastic Corp.	172USPQ556	NV, NI	Nov. 17, 1971	
3, 319, 273	The Program Aids Company, Inc. et al. v. Sport-Tech Corp. et al.	67Civ2082 S.D.N.Y.	DM	Feb. 4, 1970	
3, 319, 383	Pangborn Corp. v. Tec Supply Co.	5440 E.D. Tenn.	V, INJ	July 22, 1969	
3, 319, 384	Bery & Superior Concrete Accessories v. Vari-Seal Corp.	C72-874 N.D. Ohio	V, I	Dec. 21, 1972	
3, 319, 438	Uniflow Mfg. Co. v. King Seeley Thermos Co. Inc.	30578 E.D. Mich.	DM	May 16, 1969	
3, 319, 897	Somat Corp. v. U. of Maryland et al.	19618 D. Md.	DM	Feb. 29, 1972	
3, 320, 933	Hydro Thoran, Inc. v. Intragas, S.A.	640-72 D.C.N.J.	DM	May 23, 1972	
3, 320, 933	Automation Industries, Inc. v. Baier	656-72 D.C.N.J.	DM	May 23, 1972	
3, 321, 068	Clinical Products, Inc. v. R. J. Taylor Co. Inc. dba Amer. Surgical Supply.	11103 N.D. Ga.	V, I	Oct. 10, 1969	
3, 321, 081	Aquariums, Inc. v. National Aquarium Supplies, Inc. et al.	993-64 D.N.J.	DM	May 24, 1972	
3, 321, 081	Meta-frame v. Biozonics	176PQ237	NV	Dec. 7, 1972	
3, 321, 259	Fidelity File Box, Inc. v. Ekon Mfg. Co. et al.	68Civ1305 S.D.N.Y.	CJ, INJ	Apr. 1, 1969	
3, 323, 312	Banjovich et al v. Westinghouse Electric Corp.	17339 D. Md.	DM	Nov. 8, 1971	
3, 323, 437	Walter Kidde & Co., Inc. v. Westinghouse Electric Corp.	5676 W.D. Mich.	DM	June 5, 1969	
3, 323, 437	Westinghouse Electric Corp. v. Walter Kidde & Co.	CIV1967-334 W.D.N.Y.	DM	June 24, 1969	
3, 323, 437	James V. Knab et al. v. Walter Kidde & Co.	CA6243 W.D. Mich.	DM	Aug. 19, 1970	
3, 323, 523	Link v. Mueller Color Plate Co.	70C5 E.D. Wis.	DM, W/P	Jan. 5, 1971	
3, 324, 697	Hartford Special Machinery Co. v. Emil Roy et al.	12170 D. Conn.	DM	Jan. 9, 1969	
3, 325, 981	Deere & Co. v. Sperry Rand Corp.	168PQ150	NV	Dec. 7, 1970	
3, 325, 981	Sperry Rand Corp. v. Deere & Co.	69C1177 N.D. Ill.	DM	Aug. 5, 1969	
3, 325, 981	Sperry Rand Corp. v. Oliver Corp.	69C547 N.D. Ill.	DM	June 15, 1971	
3, 325, 988	Derring Millikin Research Corp. v. Burlington Ind. Inc., et al.	67C19L W.D. Va.	DM	May 22, 1968	
3, 325, 989	Deering Millikin Research Corp. v. Burlington Ind. Inc., et al.	67C19L W.D. Va.	DM	May 22, 1968	
3, 326, 232	Inject-O-Meter Mfg. Co., Inc. v. North Plains Fertilizer & Chemical.	164PQ653	NI, NV	Jan. 21, 1970	
3, 326, 232	Inject-O-Meter Mfg. Co. v. No. Plains Fertilizer.	169PQ70 CA5	SJ, NV, NI Aff.	Mar. 3, 1971	
3, 326, 310	Scott Douglas Ind. v. Weyerhaeuser Co.	7757 W.D. Wash.	DM	Mar. 30, 1970	
3, 326, 692	Restaurant Technology, Inc. v. Geropco Inc.	71-C-24 N.D. Ill.	CJ, VI, INJ	Sept. 4, 1971	
3, 327, 494	Hardwicke-Etter Co. v. Paul D. Campbell, et al.	1823 E.D. Tex.	DM	Sept. 4, 1969	

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3, 327, 500	W. E. Bodton, Ltd. v. Scott & Williams, Inc.	67Civ3688 S.D.N.Y.	DM	May 21, 1969	
3, 327, 745	Harrington Mfg. Co. v. White	169PQ193	V, NI	Feb. 23, 1971	
3, 327, 972	Safe Flight Instrument Corp. v. United Control Corp.	7268 W.D. Wash.	INJ	Dec. 11, 1968	
3, 328, 141	Tizon Chemical Corp. v. Process Research Products.	1050-70 D.N.J.	CJ, INJ	Nov. 20, 1971	
3, 328, 536	Lanier Electronic Lab., Inc. v. Nye Systems Inc.	12,965Civ N.D. Ga.	DM	Oct. 21, 1970	
3, 329, 852	Nachfolger GmBH etc. v. Siemens-Sim Aktiengesellschaft.	1241-71 D.N.J.	DM	Nov. 15, 1971	
3, 330, 182	Gerber Scientific Inst. Co. v. Baldwin-Kongsberg Co.	6893 S.D. Ohio Cincinnati.	DM, W/P	Nov. 23, 1970	
3, 330, 406	Kirshbaum & Taub v. GTE Sylvania, Inc.	71C941 N.D. Ill.	DM, W/P	July 28, 1971	
3, 330, 721	Keystone Plastics, Inc. v. C & P Plastics, Inc.	173USPQ355	NI	Mar. 14, 1972	
3, 331, 184	Gustav Kraus d/b/a Condor Machine Works v. Emhart Corp. et al.	167PQ385	SJ, NV	Sept. 2, 1970	
3, 332, 263	Westinghouse Electric Corp. v. General Electric Co.	Civ1968-399 W.D.N.Y.	DM	July 25, 1969	
3, 332, 327	Amerace Esna Corp. v. Highway Safety Service, Inc.	171USPQ186	VI, INJ	July 9, 1971	
3, 332, 544	Metaframe Corp. v. Miracle Pet Products.	69C294 E.D.N.Y.	CJ, INJ	Aug. 4, 1971	
3, 332, 617	Photon, Inc. v. Eltra Corp. et al.	163USPQ165	VI	Sept. 18, 1969	
3, 333, 198	International Telemeter Corp. v. Hamline International Corp. et al.	7661 W.D. Wash.	VI	Sept. 25, 1969	
3, 335, 092	Shelco v. Dow Chemical et al.	173PQ451CA7	NV Aff.	Apr. 5, 1972	
3, 335, 092	Shelco Inc. et al v. Boyle-Midway Inc. et al.	168PQ395	NV	Sept. 23, 1970	
3, 335, 300	V. B. Research & Development v. Joe W. von Brimer et al.	67-228-K S.D. Calif.	DM	June 13, 1969	
3, 335, 430	Epic Pools Corp. v. Hendon Construction Co.	709 68 D.N.J.	DM	Jan. 10, 1969	
3, 335, 713	Air-Shields, Inc. et al v. Air Reduction Co., Inc.	169USPQ450	F NV, Misrep. of art.	Mar. 18, 1971	
3, 335, 962	Am. Aero Industries Inc. v. Tritan Corp.	72-H-71 S.D. Tex.	DM, WO/P	Mar. 21, 1972	
3, 336, 178	Thiokol Chem Corp. v. Burlington Ind. Inc. et al.	3782 D. Del.	DM	June 5, 1970	
3, 336, 178	Thiokol Chem Corp. v. Burlington Industries et al.	3906 D. Del.	DM	June 29, 1972	
3, 337, 070	Giulbert, Inc. v. Security Fire Door Co.	68C455(2) E.D. Mo.	J for D	Sept. 8, 1970	
3, 337, 673	U.S. Catheter & Inst. Co. v. Meadox Medical.	622-69 D.N.J.	CJ INJ	June 30, 1971	
3, 337, 989	Sarkes Tarzian Inc. v. Standard Kollsman Industries, Inc.	69C80 N.D. Ill.	DM	Jan. 14, 1969	
3, 338, 233	Air-Shields, Inc. v. Air Reduction Co. Inc.	169PQ450	NV, NI	Mar. 18, 1971	
3, 339, 258	A. Lakin & Sons, Inc. v. Hesston Corp.	W4056 D. Kans.	DM	Aug. 22, 1969	
3, 340, 630	MBM Co. v. Joe F. Beaver d/b/a Handy Calendar Co.	W-4143 D. Kans.	VI, INJ	Jan. 27, 1970	
3, 340, 706	W. E. Booton, Ltd. v. Scott & Williams, Inc.	67Civ3688 S.D.N.Y.	DM	May 21, 1969	
3, 341, 884	Barbara Pryor v. Cheeseborough-Pond's, Inc.	68C1223 N.D. Ill.	DM, W/P	Sept. 22, 1970	
3, 341, 955	Everpres v. Phillips-Van Heusen	168PQ489 M.D. Ala.	NV	July 22, 1970	
3, 341, 982	Brunswick Corp. v. Thermotectors, Inc.	70C498 N.D. Ill.	J. for D	Aug. 11, 1972	
3, 342, 582	Bender et al v. Polymer Insulations, Inc.	69H1062 S.D. Tex.	VI, INJ	Jan. 28, 1971	
3, 343, 682	Juva-Tex, Inc. v. Star Filter Co.	30848 E.D. Mich.	DM W/P	Apr. 11, 1969	
3, 343, 961	Mix Mill v. Agri King	70C63 N.D. Ill.	DM	Nov. 30, 1970	
3, 343, 961	Mix Mill Inc. et al v. Walter Johnson et al.	70C30CR N.D. Iowa	DM, WO/P	Nov. 30, 1970	
3, 343, 961	Mix-Mill, Inc. et al v. Simonson Iron Works, Inc.	70-C-29-CR N.D. Iowa	DM	Feb. 22, 1971	
3, 344, 312	Oxy-Dry Sprayer Corp. v. Electro Sprayer Systems, Inc.	68C2360 N.D. Ill.	DM W/P	June 5, 1969	
3, 344, 793	Flexnit Co., Inc. v. Melody Bra & Girdle Co., Inc.	68Civ542 S.D.N.Y.	Inj	Apr. 16, 1968	
3, 344, 793	Flexnit Co. Inc. v. Figure Builder Foundations, Inc.	68Civ4657 S.D.N.Y.	Inj	Jan. 10, 1969	
3, 344, 826	Runnion et al. v. Stetson Ross Machine Co.	8225 W.D. Wash.	DM	Sept. 18, 1970	
3, 344, 993	Swenson Spreader v. Ambac Ind.	70C88 N.D. Ill.	CJ, V	Mar. 3, 1971	
3, 345, 828	Elmwood Liq Products v. Singleton Packing Corp.	69-132 M.D. Fla.	DM	Mar. 11, 1971	
3, 346, 300	Louis A. Grant, Inc. v. Edward Gray Corp. et al.	69C81 N.D. Ill.	V, I	Aug. 5, 1970	

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3, 347, 432	Lanier Electronic Lab. Inc. v. Nye Systems, Inc.	12, 965Civ N.D. Ga.	DM	Oct. 21, 1970	
3, 348, 698	Interlake Steel Corp. v. Unarco Industries Inc.	69C1097 N.D. Ill.	DM WO/P	June 25, 1969	
3, 349, 285	Angelica Corp. v. Medline Industries, Inc.	69C581 N.D. Ill.	V	June 5, 1969	
3, 349, 285	Angelica Corp. v. Will Ross, Inc.	69C404 E.D. Wis.	DM	Apr. 6, 1970	
3, 349, 645	Silvey v. Nielsen Corp.	164USPQ657	NV	Feb. 24, 1970	
3, 349, 645	Silvey v. Nielsen Corp.	168PQ679 CA9	NV	Feb. 9, 1971	
3, 350, 632	Sinclair Oil & Gas Co. v. Union Oil Co. of Calif.	68Civ3261 S.D.N.Y.	DM	Aug. 10, 1970	
3, 250, 632	Hiroca Corp. v. Union Oil Co. of Calif. et al.	68Civ3412 S.D.N.Y.	DM	Aug. 10, 1970	
3, 350, 651	Spectral Dynamics Corp. v. Wavetek Corp.	68-292S S.D. Calif.	CJ	Aug. 18, 1969	
3, 350, 733	Hanna v. Trans World Car Systems.	68C137 E.D.N.Y.	CJ, INJ	Mar. 18, 1971	
3, 350, 733	Hanna v. Hurricane Car Wash Systems et al.	70-530 D. Ariz.	CJ, I	Mar. 20, 1972	
3, 350, 879	Outboard Marine Corp. v. Brunswick Corp.	67C639 N.D. Ill.	DM WO/P	May 28, 1968	
3, 351, 073	Richard Gregg Mfg. Co. Inc. v. Ruth S. Rigney d/b/a Mircale City Beauty Salon & Wig Bar.	68-422NE N.D. Ala.	V, I	May 5, 1969	
3, 351, 289	Quigley Co. Inc. v. Bethlehem Steel Corp.	3862 D. Del. (Wilm.)	DM	Feb. 22, 1972	
3, 351, 368	Sweet v. Marvel Metal Products Co.	171USPQ36	NV	June 29, 1971	
3, 351, 460	Quigley Co. Inc. v. Bethlehem Steel Corp.	3862 D. Del.	DM	Feb. 22, 1972	
3, 352, 217	Peters et al v. Compton	70-4-358 S.D. Tex.	VI, Inj	Mar. 16, 1972	
3, 353, 327	Mira-Pak Inc. v. Woodman Co.	15788 N.D. Ga.	DM	Jan. 24, 1972	
3, 353, 478	Trash Masters et al v. Sears Roebuck, Inc.	70-582 E.D. La.	DM	Feb. 9, 1971	
3, 353, 478	Whirlpool Corp. v. Trash Masters Corp.	70-455K D. Md.	DM WO/P	Feb. 16, 1971	
3, 353, 882	Seeburg Corp. of Delaware v. Specialty Sales Corp. of America.	69C2200 N.D. Ill.	DM W/P	Apr. 1, 1970	
3, 354, 901	Robertshaw Controls Co. v. Honeywell, Inc.	68-1132-S C.D. Calif.	DM W/P	July 3, 1969	
3, 356, 190	Hirsch v. Willcox et al.	72Civ686, S.D.N.Y.	J for D	Sept. 5, 1972	
3, 356, 226	Filterite Corp. v. Tate Eng. Inc.	167PQ450	V, NI	Sept. 30, 1970	
3, 356, 226	Filterite Corp. v. Tate Eng. Co.	170PQ190 CA4	Aff, V, NI	May 27, 1971	
3, 356, 365	Marlin Toy Products, Inc. v. Sidney A. Tarrson, Co.	67C832 N.D. Ill.	Inj	Nov. 27, 1968	
3, 358, 319	Hill-Rom Co. v. Beltor Mfg. Corp.	279-71 D.N.J.	CJ INJ	June 2, 1971	
3, 359, 169	Armour Pharmaceutical Co. v. Revlon, Inc.	68Civ457 S.D.N.Y.	DM W/P	Oct. 24, 1969	
3, 359, 351	Bender et al v. Polymer Insulations, Inc.	69H1062 S.D. Tex.	VI INJ	Jan. 28, 1971	
3, 359, 934	Thiokol Chem Corp. v. Burlington Ind. Inc et al.	3906 D. Dela.	DM	June 5, 1970	
3, 359, 934	Thiokol Chem Corp. v. Burlington Ind. Inc. et al.	3782 D. Dela.	DM	June 5, 1970	
3, 359, 934	Thiokol Chem Corp. v. Burlington Industries et al.	3906 D. Dela.	DM	June 29, 1972	
3, 360, 697	Stratford Retreat House v. Voltronics Corp.	16-68 D.N.J.	DM	Feb. 19, 1970	
3, 361, 114	T.F.H. Publ. Inc. v. Sternco Ind. Inc.	48674 N.D. Calif (SF)	DM W/P	Mar. 21, 1968	
3, 361, 150	Universal Interloc Inc. v. Hawkins, Chem Co.	71-1394 CD. Calif.	INJ	Aug. 18, 1972	
3, 361, 150	Universal Interloc v. Magna Corp.	67-979-FW C.D. Calif.	CJ I	Apr. 9, 1971	
3, 361, 566	T.F.H. Publ. Inc. v. Sternco Ind. Inc.	48674 N.D. Calif. (SF)	DM	Mar. 21, 1968	
3, 361, 652	Conversion Chem. Corp. v. Lea-Ronal, Inc.	13241 D. Conn.	DM	Feb. 9, 1972	
3, 362, 829	Top Scor Products, Inc. v. Honey	15022 D. Conn.	CJ, INJ	July 28, 1972	
3, 363, 224	Amp Inc. v. SAE Advanced Packaging Inc.	8680G377	INJ	June 20, 1969	
3, 363, 422	Tuizillo Contracting Co., Inc. v. Intrusion Prepack Co et al.	C68-671 ND Ohio.	CJ	Jan. 28, 1972	
3, 363, 626	Deknatel, Inc. v. Bentley Sales	173 PQ 129	VI	Nov. 1, 1971	
3, 363, 627	Deknatel, Inc. v. Bentley Sales	173 PQ 129	VI	Nov. 1, 1971	
3, 364, 664	Cockle Ventilator Co. Inc. v. Vent Master Corporation et al.	69H613 S.D. Tex.	DM	Dec. 30, 1969	
3, 364, 829	Perfect Film & Chemical Corp. v. Aimes Engineering Co., Inc.	68C2272 N. Ill.	DM	Jan. 31, 1969	
3, 366, 731	Edward Wallerstein v. Market Facts, New York, Inc.	68Civ4653 S.D.N.Y.	DM	Oct. 15, 1968	
3, 366, 731	Edward Wallerstein v. Adtel Ltd.	68Civ1618 S.D.N.Y.	DM	Oct. 15, 1968	
3, 366, 911	CTS Corp. v. P.R. Mallory & Co. Inc.	68C1362 N.D. Ill.	DM	Feb. 28, 1969	
3, 366, 917	AMP Inc. v. Virginia Panel Corp.	69C27H W.D. Va.	I INJ	Feb. 26, 1970	
3, 367, 126	Struthers Sci & Int. Corp. v. General Foods Corp.	3850 D. Del.	DM	Feb. 23, 1972	

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3, 367, 270	Panther Pumps & Equipment Co., Inc. Hydrocraft, Inc. et al.	67C201 N.D. Ill. (Chicago).	INJ	Nov. 24, 1970	
3, 367, 270	Panther Pumps & Equipment Co., Inc. v. Hydrocraft Inc. et al.	175USPQ577 CA7	V, I	Oct. 24, 1972	
3, 367, 809	Branson Instr., Inc. v. Sonics & Materials, Inc. et al.	14081 D. Conn.	CJ INJ	Nov. 26, 1971	
3, 368, 147	Combustion Engineering, Inc. v. Odex Controls, Inc.	68H-883 S.D. Tex.	DM, WO/P	Feb. 9, 1970	
3, 368, 280	C & B Corporation v. Sonoptics Corp. et al.	69698CivWM S.D. Fla.	VI, INJ	Mar. 24, 1970	
3, 368, 475	Mix Mill v. Agri-King	70C63 N.D. Ill.	DM	Nov. 30, 1970	
3, 368, 501	Harvey G. Kuhlman v. Lester L. Schmidt.	69-C 533 E.D. Wis.	VI, INJ	Dec. 9, 1969	
3, 368, 516	AB Volvo Penta v. Brunswick Corp.	69C322 E.D. Wis.	DM, WO/P	June 4, 1970	
3, 368, 823	Raymond E. Templeton et al. v. Richard C. Mansperger	8640G7	I	Apr. 15, 1969	
3, 368, 932	Flame Laminating Machines Corp. v. Allen Knitting Mills, Inc.	68Civ4155 S.D.N.Y.	DM, W/P	July 2, 1970	
3, 368, 932	United Bonding Corp. v. Flame Laminating Machines Corp.	68Civ5081 S.D.N.Y.	DM, W/P	July 2, 1970	
3, 368, 932	Flame Laminating Machines Corp. v. Ideal Foam Corp.	69C8 E.D.N.Y.	DM	Nov. 9, 1971	
3, 369, 121	E.R. Squibb & Sons, Inc. v. Mallin- ckrodt Chem. Works.	68C331(1) E.D. Mo.	DM	Apr. 15, 1970	
3, 370, 261	CTS Corp. v. P. R. Mallory & Co., Inc.	68C1362 N.D. Ill.	DM	Feb. 28, 1969	
3, 371, 383	Swedlow Inc. v. Rohm & Haas Co.	69-2343 C.D. Calif.	DM	Mar. 9, 1960	
3, 371, 828	Nemo Ind. Inc. v. LIF Machine Co.	70-C1406 E.D.N.Y.	INJ	Aug. 16, 1971	
3, 372, 493	Avalon Mfg. v. Art Award Co.	68Civ1047 S.D.N.Y.	DM, WO/P	Mar. 19, 1971	
3, 372, 879	Leggett Co. v. Allen Electric Co.	70C133 N.D. Ill.	V	Jan. 19, 1972	
3, 373, 493	Avalon Mfg. v. Friends Industries	68Civ1048 S.D. N.Y.	DM	June 28, 1971	
3, 375, 381	Stimulant Products Inc. v. Vibrex Corp.	161PQ513	NI	Apr. 7, 1969	
3, 375, 643	Sperry Rand Corp. v. Deere & Co.	69C1177 N.D. Ill.	DM	Aug. 5, 1969	
3, 375, 643	Sperry Rand Corp. v. Oliver Corp.	69C547 N.D. Ill.	DM	June 15, 1971	
3, 375, 643	Deere & Co. v. Sperry Rand	168PQ150	NV	Dec. 7, 1970	
3, 375, 796	J. C. Herman & Co. v. The Singer Co., Inc.	69Civ140 S.D.N.Y.	DM	Sept. 10, 1970	
3, 375, 800	Cont. Oil Co. v. Double D. Mfg. Co. Inc. et al.	70-H-102 S.D. Tex.	CJ	Sept. 25, 1970	
3, 375, 976	Inject-O-Meter Mfg. Co. Inc. v. North Plains Fertilizer & Chemical, Inc.	164PQ653 N.D. Tex.	NV, NI	Jan. 21, 1970	
3, 376, 976	Inject-O-Meter v. No. Plains Fertilizer.	169PQ70 CA5	Aff. SJ NV	Mar. 3, 1971	
3, 376, 371	Swedlow Inc. v. Rohm & Haas Co.	69-2343 C.D. Calif.	DM	Mar. 9, 1970	B of A.
3, 376, 388	Reiffin v. Heathkit Electronic Center et al.	72C1812 N.D. Ill.	DM	Aug. 2, 1972	
3, 376, 752	Malone v. Twin Falls Construction Co. et al.	1-70-113 D. Idaho	DM	Nov. 21, 1972	
3, 376, 842	AB Volvo Penta v. Brunswick Corp.	69-C-322 E.D. Wis.	DM wo/p	June 4, 1970	
3, 377, 184	Kukolf v. Dove Creations, Inc.	68-4339 S.D.N.Y.	DM wo/p	June 29, 1972	
3, 377, 716	Electro-Learner Corp. v. Responsive Environments Corp.	68Civ4447 S.D.N.Y.	DM	June 26, 1970	
3, 377, 770	American Packaging Corp. and Gen- eral Classics, Inc. v. Stone Con- tainer Corp.	C69-169 N.D. Ohio	DM wo/p	May 13, 1969	
3, 377, 770	Stone Container Corporation v. Gen- eral Classics, Incorporated.	68C2233 N.D. Ill.	DM wo/p	May 13, 1969	
3, 377, 770	American Packaging v. Stone Con- tainer.	C69-169 N.D. Ill.	DM	July 23, 1971	
3, 379, 534	Amylase A.G. v. P. Ballantine & Sons, Inc.	Civ745-68 D.N.J.	DM	June 16, 1969	
3, 380, 333	Intermountain Research & Engineer- ing Co., Inc. et al. v. Hercules, Inc.	171USPQ577	NV NI F	June 15, 1971	
3, 380, 455	Flexnit Co. Inc. v. Deluxe Girdlecraft Co. Inc.	68Civ1888 S.D.N.Y.	DM	July 19, 1968	
3, 380, 927	Quaker Chem. Corp. v. Dexter Chem. Corp. et al.	Civ. 480-69 D.N.J.	DM wo/p	Apr. 17, 1970	
3, 380, 927	Dexter Chem. Corp. v. Quaker Chem. Corp. et al.	Civ. 715-69 D.N.J.	DM wo/p	Apr. 17, 1970	
3, 381, 302	Struthers Scientific & Int. Corp. v. Gen. Foods Corp.	417-68 D.N.J. (Newark).	DM	June 17, 1968	
3, 381, 302	General Foods Corp. v. Struthers Scientific & Int. Corp.	3566 D. Del.	DM	Feb. 23, 1972	
3, 382, 045	Catalysts & Chem. Inc. v. The Stand- ard Oil Co.	C68-459 N.D. Ohio	DM wo/p	Apr. 20, 1970	
3, 382, 280	Monsanto Co. v. Rohm & Haas Co.	164PQ565	NV F (misrep of test results).	Feb. 17, 1970	
3, 382, 280	Monsanto Co. v. Dawson Chemical Co.	165USPQ560	VI	May 4, 1970	
3, 382, 280	Monsanto Co. v. Dawson Chemical Co.	170PQ199 CA5	Reversed CE	June 8, 1971	
3, 382, 280	Monsanto Co. v. Rohm & Haas Co.	165USPQ683	NV	May 21, 1970	
3, 382, 280	Monsanto Co. v. Rohm & Haas Co.	172USPQ323 CA3	Aff., NV, F (misrep).	Jan. 12, 1972	

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3, 382, 280	Monsanto Co. v. Chemical Insecticide Corp.	447-8 D.N.J.	DM	Dec. 3, 1971	
3, 382, 280	Monsanto Co. v. Red Barn Chemicals Co.	68-H-399 S.D. Tex.	V, I, CJ	June 3, 1968	
3, 382, 280	Monsanto Co. v. Baldwin-Montrose Chem. Co.	C-448-68 D.N.J. (Newark)	DM	June 18, 1968	
3, 382, 285	Ashland Oil Co. Inc. v. BASF-Wyandotte Chem. Corp.	8392 S.D. Ohio	DM	Aug. 22, 1972	
3, 383, 452	Seeburg Corp. v. Sakata International Inc.	70C961 N.D. Ill.	CJ V	Apr. 28, 1972	
3, 383, 452	Seeburg Corp. v. Wurlitzer	70C2581 N.D. Ill.	CJ V	Mar. 5, 1971	
3, 383, 452	The Seeburg Corp. v. National Baron Corp.	69C1123 N.D. Ill.	DM	Mar. 27, 1970	
3, 383, 844	Sperry Rand Corp. v. Deere & Co.	69C1177 N.D. Ill.	DM	Aug. 5, 1969	
3, 383, 844	Sperry Rand Corp. v. Oliver Corp.	69C547 N.D. Ill.	DM	June 15, 1971	
3, 383, 844	Deere & Co. v. Sperry Rand	168PQ150	NV	Dec. 7, 1970	
3, 385, 108	Combustion Engineering Inc. v. Odex Controls, Inc.	68H883 S.D. Tex.	VI	Feb. 9, 1970	
3, 385, 318	Progressive Dynamics v. Bristol Products	69S588 N.D. Ind.	CJ, INJ	Aug. 25, 1971	B of A.
3, 385, 649	Hicks v. Chicago Candle Corp.	71C665 N.D. Ill.	CJ	July 30, 1971	
3, 386, 039	Spectral Dynamics Corp. v. Wavetek Corp.	68292 S.S.D. Calif.	CJ	Aug. 18, 1969	
3, 386, 233	Sperry Rand Corp. v. Deere & Co.	69C1177 N.D. Ill.	DM	Aug. 5, 1969	
3, 386, 233	Sperry Rand Corp. v. Oliver Corp.	69C547 N.D. Ill.	DM	June 15, 1971	
3, 386, 233	Deere & Co. v. Sperry Rand	168PQ150	NV	Dec. 7, 1970	
3, 386, 564	Emery Co. Inc. v. Trujillo et al.	1213-5 N.D. Ala.	DM wo/p	May 10, 1972	
3, 387, 396	Lara Simplex Internationale, Inc. v. Heat Tapes, Inc.	68C1073 N.D. Ill.	INJ	Nov. 25, 1969	
3, 387, 396	Lava-Simplex Internationale, Inc. v. Lampcraft Industries	68C1074 N.D. Ill.	DM wo/p	Dec. 19, 1968	
3, 387, 396	Lava-Simplex Internationale, Inc. v. Herbert S. Russcol and Monk, Inc.	68C1075 N.D. Ill.	V I INJ Aff NV NI NV	Dec. 19, 1968	
3, 387, 666	Hadfield v. Ryan Equipment Co.	173USPQ322 CA8	Aff	Mar. 22, 1972	
3, 387, 786	Imperial Landscape & Supply Co., Inc. v. Lance Construction Supplies, Inc.	69C1116 N.D. Ill.	I INJ	Oct. 21, 1969	
3, 388, 752	Velco Offshore Ind. Inc. v. Corey Supply Co. Inc.	69H667 S.D. Tex.	VI, INJ	Mar. 26, 1970	
3, 388, 752	Velco Offshore Ind. Inc. f/k/a Ventura Tool Co. v. Richard J. Hacker et al.	5019 E.D. Tex.	INJ	Apr. 3, 1970	
3, 388, 972	Catalysts & Chem. Inc. v. The Standard Oil Co.	C68-459 N.D. Ohio	DM wo/p	Apr. 20, 1970	
3, 389, 236	Alarm Device v. On Guard Corp. et al.	8830G5	CJ, INJ	Apr. 22, 1971	
3, 389, 860	Bernardi Bros. v. Pride Mfg.	879-68 D.N.J.	DM	May 24, 1971	
3, 390, 480	Basic Products Development Co. Inc. v. Planner et al.	132-69 D.N.J.	DM	Oct. 20, 1971	
3, 390, 533	Jursich et al. v. J. I. Case Co.	175USPQ691	NV	Oct. 5, 1972	
3, 390, 652	Morris v. Spencer Gifts et al.	943-68 D.N.J.	DM wo/p	Mar. 23, 1971	
3, 391, 749	Land & Marine Rental Co. v. Butler Drilling Co.	70H264 S.D. Tex.	DM	May 12, 1970	
3, 392, 809	Dunlop Co. Ltd. v. Kelsey Hayes Co.	30629 E.D. Mich.	I	May 19, 1972	
3, 393, 444	Eli Lilly Co. v. Mid West Automation	70C1220 N.D. Ill.	VI, INJ	Aug. 25, 1970	
3, 394, 405	B. F. Goodrich v. Mann Mfg. Inc.	895OG391 S.D.N.Y.	DM	June 18, 1971	
3, 394, 422	O'Brien Manufacturing Company, Inc. v. Flexible, Inc.	C69-86 N.D. Ohio	DM wo/p	Sept. 29, 1969	
3, 394, 729	Layne & Bowler Pump Co. v. Gifford Hill Westen, Inc.	CA 5-787 N.D. Tex.	J for P (as owner)		
3, 396, 096	Gelman Instrument Co. v. Tipton Golias d/b/a Helena Lab.	31686 E.D. Mich.	DM wo/p	Feb. 18, 1969	
3, 397, 522	Deere & Co. v. Hesston Corp.	167USPQ102	NV	Mar. 23, 1970	
3, 397, 522	Deere & Co. v. Hesston Corp.	169PQ132 CA5	NV Aff	Mar. 12, 1971	
3, 397, 727	Pacific Spring Engineering Corp. v. Sloss & Brittain	171USPQ26	NV, NI	June 16, 1971	B of A.
3, 399, 833	Combustion Research Corp. v. Green	36609 E.D. Mich.	INJ	Apr. 12, 1972	
3, 400, 038	Bigelow-Sanford, Inc. v. Giffen-Burgess Corp.	Civ 3622 D. Del.	DM wo/p	Aug. 6, 1969	
3, 400, 227	Gates Learjet Corp. v. Magnasynne Craig Corp.	173PQ203	V, I	Feb. 25, 1973	
3, 400, 227	Magnasynne Craig Corp. v. Lear Jet Ind. Inc., et al.	69-2044 1H C.D. Cal.	DM wo/p	Mar. 5, 1970	
3, 400, 949	Kendall et al. v. Whattaff et al.	882 OG 451		Oct. 20, 1970	
3, 401, 586	Oscar Schmidt Inc. v. Rhythm Band, Inc.	CA-3-3142-C N.D.	CJ, Inj, V, I	June 7, 1971	
3, 401, 909	Thomas L. Kalahar, d/b/a Perfix Mfg. Co. v. Dur-O-Peg Inc., Industrial Precision Co.	70C9 N.D. Ill.	DM wo/p	Nov. 13, 1970	
3, 401, 944	Automatic Radio Mfg. Co. Inc. v. Leonard Fish et al.	69C237 N.D. Ill.	DM wo/p	May 19, 1969	
3, 403, 417	Hanna v. Hurricane Car Wash Systems et al.	70-530 D. Ariz.	CJ, I	Mar. 20, 1972	

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3, 403, 527	Elmwood Liquid Products v. Singleton Packing Corp.	69-132 M.D. Fla.	DM	Mar. 11, 1971	
3, 403, 868	Magnasynne Craig Corp. v. Lear Jet Ind. Inc. et al.	69-2044 1H C.D. Cal.	DM w/p	Mar. 5, 1970	
3, 403, 868	Gates Learjet Corp. v. Maganasynne Craig Corp.	173 PQ 203	V, I	Feb. 25, 1972	
3, 404, 007	Struthers Scientific Corp. v. General Foods Corp.	3666 D. Del.	DM	Feb. 23, 1972	
3, 404, 334	Marshall v. Telematic-UXL Corp.	17-C-283 E.D.N.Y.	DM	May 5, 1971	
3, 408, 494	Hercules Inc. v. NOPCO Chemical.	12188 N.D. Ga.	DM	Mar. 18, 1971	
3, 404, 494	Wolfe v. Belkin	72C86R W.D. Va.	DM	Oct. 24, 1972	
3, 405, 376	Ledex Inc. v. United States	54-69 Court Claims	J for P	Oct. 27, 1972	
3, 407, 080	American Potato Corp. v. General Foods Corp.	4138 D. Del.	DM w/p	Oct. 20, 1971	
3, 407, 617	Emerson Electric Co. v. Spartan Valve Co.	71C612(4) E.D. Mo.	DM wo/p	June 13, 1972	
3, 408, 306	Hercules Inc. v. Drew Chem. Co.	12187 N.D. Ga.	DM	June 8, 1970	
	Drew Chem. Co. v. Hercules Inc.	69 Civ 21 S.D.N.Y.	DM wo/p	Oct. 1, 1970	
3, 408, 523	Refac Technology v. Gen. Instrument	70C1044 N.D. Ill.	DM w/p	Mar. 5, 1971	
3, 408, 572	Digitronics Corp. v. Marketing Systems Inc.	1076-69 D.N.J.	DM	Dec. 26, 1972	
3, 408, 572	Digitronics Corp. v. Marketing Systems Inc.	1533-69 D.N.J.	DM	Jan. 26, 1972	
3, 409, 224	Union Carbide Corp. v. National Soda Straw Co.	69C738 N.D. Ill.	DM w/p	Feb. 17, 1970	
3, 409, 275	Hy-Way Heat System v. Jaclair Inc. et al.	69C491 E.D. Wis.	DM w/p	June 23, 1971	
3, 409, 916	Bilnor Corp. v. Atirol Mfg. Co., Inc.	71C677 E.D.N.Y.	DM	Jan. 31, 1972	
3, 410, 330	Matyas v. Great Lakes Hardware	32306 E.D. Mich.	DM	July 20, 1972	
3, 413, 127	Armour v. Swift Co.	69C1635 N.D. Ill.	DM	May 12, 1971	
3, 413, 171	Hexcel Corp. v. Ellinor Corp.	175 PQ 606	V, I	Aug. 23, 1972	
3, 413, 459	Sonneman Associates Inc. v. Tannenbaum et al.	68-4907 S.D.N.Y.	DM Rule 41a	June 28, 1972	
3, 414, 769	Wabash Magnetics Inc. v. Ferromagnetics Inc. et al.	69F16 N.D. Ind.	DM	Feb. 25, 1969	
3, 415, 086	Patrick M. Trainor et al. v. Fort Lock Corp.	68C1719 N.D. Ill.	DM w/p	Mar. 4, 1970	
3, 415, 360	Williams Gold Refining Co. v. Dentsply Int. Inc.	3950 D. Del.	DM wo/p	Jan. 3, 1972	
3, 416, 659	Reynolds Metals Co. v. Linderman Eng. Co. Inc., et al.	3474-69 D.C.D.C.	License/ord	Nov. 30, 1971	
3, 416, 763	Albert M. Moreno v. Dan Sabia et al.	69-234 Civ-T M.D. Fla.	Inj	Jan. 15, 1970	
3, 419, 071	Vetco Offshore Ind. Inc. v. Cameron Iron Works Inc.	72-313-CC D.C. Calif.	DM wo/p	Dec. 12, 1972	
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3, 419, 876	Tenatronics Ltd. Inc. v. Tenna Corp.	C69-760 N.D. Ohio	DM	Nov. 4, 1969	
3, 421, 171	K-tel International v. Sav-On Drugs Inc. et al.	72-1160 IH C.D. Calif.	Inj	Nov. 27, 1972	
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3, 421, 290	Enviro Air v. United Air Specialists.	168 PQ 91	nV	Nov. 18, 1970	
3, 421, 731	Metallurgical Exoproducts Corp. v. Insul Co. Inc.	C70-391 N.D. Ohio	CJ	June 27, 1972	
3, 422, 189	Moraine Products Inc. v. Plough Inc. et al.	69-956 CivCF S.D. Fla.	DM w/p	Mar. 16, 1970	
	Atlas v. Moraine Products Inc.	175 PQ 693	nV		
3, 423, 149	Honey Toy Industries Inc. v. B.	69-1111-C D Mass.	DM w/p/I & wo/p/P.	Mar. 20, 1970	
3, 423, 644	Bissett-Berman Corp. v. Miller Research Corp.	20615 Civ. D Md.	DM w/p & wo/p.	Sept. 15, 1969	
3, 423, 648	Bissett-Berman Corp. v. Miller Research Corp.	20615 Civ. D. Md.	DM w/p & wo/p.	Sept. 15, 1969	
3, 423, 805	Struthers Scientific v. Rappl & Hoenig	Civ 1966-216 W.D.N.Y.	V, Inj	Mar. 20, 1971	
3, 423, 805	Struthers Scientific v. Rappl & Hoenig	172 PQ 257 CA2	NV, Rev	Jan. 4, 1972	
3, 423, 860	Litho Paint Poster Co. v. Anthony J. Pizza Food Products Corp.	69C1950 N.D. Ill.	DM	Oct. 1, 1969	
3, 425, 435	Metropolitan Petroleum Petrochemicals Co. v. Aetna Chemical Corp.	C992-71 D.N.J.	DM	Nov. 4, 1971	
3, 425, 676	Dietz et al. v. Newman Premier Corp.	69C197 E.D.N.Y.	DM	Nov. 8, 1971	
3, 425, 626	John F. Dietz et al. v. Newman Premier Corp.	69C197 E.D.N.Y.	DM	Nov. 8, 1971	
3, 425, 626	John F. Dietz et al. v. Sidney A. Tarrson Co. et al.	69C578 N.D. Ill.	CJ	Oct. 28, 1969	
3, 425, 772	Alpa Corp. v. Bio-Engineering Inc. et al.	51679 N.D. Calif.	J for P	Apr. 29, 1970	
3, 426, 580	Nupro Co. v. Guy Sprater Co. Inc. et al.	4-72Civ20 D. Minn.	CJ, Inj	Nov. 30, 1972	B of A.

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3, 428, 356	Adolph Anderson et al. v. Morrison Knudson Co. Inc. et al.	2532 E.D. Wash.....	DM wo/p.....	Dec. 16, 1969	
3, 429, 013	ACMF Lane Co. v. Richo Plastic Co. et al.	69C458 N.D. Ill.....	CJ, V, Inj.....	Sept. 5, 1969	
3, 423, 080	Tizon Chem. Corp. v. Process Roc. Prod.	1050-70 D.N.J.....	CJ, Inj.....	Nov. 10, 1971	
3, 429, 410	Formspray Co. v. Cobat Engineering..	69-6631 E.D. Wis.....	DM w/p.....	Nov. 30, 1970	
3, 430, 463	Hayes Corp. v. London-Aire Inc.....	71-1379 S.D. Fla.....	V, I, Inj.....	Dec. 20, 1971	
3, 432, 793	Muska et al. v. Sierra Elec.....	72C2234 N.D. Ill.....	DM.....	Dec. 8, 1972	
3, 435, 675	Lear Siegler v. Intercontinental Dynamics.	891-70 D.N.J.....	DM.....	Jan. 5, 1971	
3, 436, 787	Steamatic Inc. v. Crane.....	71-206-JCK S.D. Fla.....	DM w/p.....	July 15, 1971	
3, 437, 457	ARF Development et al. v. Huyck Corp. et al.	70C2461 N.D. Ill.....	DM.....	Aug. 24, 1971	
3, 437, 762	Gates Learjet Corp v. Magnasyn Craig Corp.	173 PQ 203.....	V, I.....	Feb. 25, 1972	
3, 439, 374	Steamatic Inc. v. Crane.....	71-206-JCK S.D. Fla.....	DM w/p.....	July 15, 1971	
3, 439, 450	Regents Univ. of Calif. v. Chapman d/b/a/etc.	71-2838-DWW C.D. Calif.....	CJ, Inj.....	Sept. 1, 1972	
3, 440, 423	ER Squibb & Sons Inc. v. Mallinckrodt Chem. Works.	69c131(z) E.D. Mo....	DM.....	Apr. 15, 1970	
3, 441, 027	Lehman v. Michelson.....	70-1366 CIUJCK S.D. Fla.....	CJ, I, Inj.....	June 26, 1971	
3, 444, 621	GAC Int'l v. Unitek Corp.....	616-70 D.N.J.....	CJ, DM.....	Dec. 10, 1970	
3, 444, 865	Carousel Fashions Inc. v. Higbee Co..	71-1012 N.D. Ohio....	DM w/p.....	Feb. 29, 1972	
3, 447, 351	Engel Equipment Inc. v. Lock Former Co.	71C314(2) E.D. Mo....	V.....	Feb. 18, 1972	B of A.
3, 448, 238	Wagner Electric v. Weatherhead.....	69 F 109 N.D. Ind....	J for D.....	May 22, 1972	B of A.
3, 449, 129	Struthers Scientific & Int. Corp. v. General Foods Corp.	3725 D. Del.....	DM.....	Aug. 19, 1970	
3, 450, 060	Lowell K. Adams et al. v. National Beef Packing.	W-4336 C.D. Kans....	V.....	Oct. 26, 1970	
3, 450, 212	Cline Ind. Inc. v. Harrison Mfg. Co..	72-39 W.D. Okla....	DM w/p.....	Jan. 31, 1972	
3, 450, 436	Leco Inc. v. Stoney's Hi-Lift Service Inc.	71-436 N.D. Fla.....	DM.....	May 23, 1972	
3, 451, 708	F. Don Brooks v. Chadwick-Miller et al.	69H578 S.D. Tex.....	DM.....	Aug. 6, 1969	
3, 452, 300	Merrimac R & D v. Western Electric..	1523-70 D.N.J.....	DM.....	June 14, 1971	
3, 452, 477	Weather Control Shutters v. Bernardo Alum. Fabricators.	70 1257 S.D. Fla.....	DM w/p.....	May 11, 1971	
3, 454, 273	General International Ind. v. Mont. Ward & Co.	69C2641 N.D. Ill.....	DM.....	Dec. 7, 1970	
3, 458, 783	San Fernando Electric Mfg. Co. v. Erie Technological Products Inc.	108-71 W.D. Pa.....	CJ.....	July 13, 1972	
3, 459, 302	Hydro-Clear Corp v. Kliger Enterprises.	901 OG 775.....	DM w/p.....	July 13, 1972	
3, 459, 614	Consolidated Productions v. GEPCO Inc.	70 184 WM S.D. Fla....	CJ, V & I.....	Feb. 12, 1971	
3, 460, 933	Quigley Co. Inc. v. Bethlehem Steel Corp.	3862 D. Del.....	DM.....	Feb. 22, 1972	
3, 463, 324	Central Specialties Co. v. Robert G. Schaefer et al.	165 PQ 15 N.D. Ill....	nl.....	Feb. 12, 1970	
3, 463, 342	Cenco Med. v. Thermovac Ind.....	70C2683 N.D. Ill.....	CJ, V & I Inj.....	Apr. 16, 1971	
3, 464, 424	Buzzelli v. 3M Co.....	35919 E.D. Mich.....	nV, SJ, DM w/p.....	Aug. 22, 1972	
3, 464, 741	Wagner Electric v. Weatherhead Co..	69F109 N.D. Ind.....	DM.....	Aug. 19, 1970	
3, 465, 666	James V. Knab et al. v. Walter Kidde and Co.	CA6243 W.D. Mich.....	DM.....	Aug. 19, 1970	
3, 467, 761	Plummer v. Bostrom et al.....	1045-70 D.N.J.....	CJ, Inj.....	Feb. 7, 1972	
3, 469, 557	Penn Yan Boats Inc. v. Sea Lark Boats Inc. et al.	175 PQ 260.....	V & I.....	June 6, 1972	
3, 469, 572	Becton Dickinson v. Sherwood Ind....	175 PQ 337.....	nV, 1, 5, 6 nl F lack of candor.	Sept. 11, 1972	
3, 470, 615	Williams Gold Refining Co. v. Dentsply Int. Inc.	3950 D. Del.....	DM wo/p.....	Jan. 3, 1972	
3, 471, 596	Williams Gold Refining Co. v. Dentsply Int. Inc.	3950 D. Del.....	DM wo/p.....	Jan. 3, 1972	
3, 472, 939	Millmaster Onyx Corp v. Lonza Inc....	C1800-71 D.N.J. 900 OG 1225.	In.....	Dec. 21, 1972	
3, 473, 251	Fedtro Inc. v. Lear Siegler.....	70C118 S.D.N.Y.....	DM wo/p.....	Aug. 4, 1971	
3, 473, 509	USA v. Marifarms Inc.....	174 PQ 481.....	DM motions.....	Dec. 26, 1972	
3, 474, 543	Cenco Med v. Thermovac Ind.....	70 C 2863 N.D. Ill.....	CJ, V & I Inj.....	Apr. 16, 1971	
3, 474, 553	S ostrom Co. v. Foldamatic Systems..	69-1293-JLK S.D. Fla.....	DM.....	Nov. 17, 1971	
	Sjostrom Co. v. Kupferschmid.....	13537 D. Conn.....	DM.....	Oct. 8, 1971	
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3,475,756	Avanti R. & D Inc. v. Allied Radio Corp.	69C2226 N.D. Ill.	Inj.	May 4, 1970	
3,476,260	Jarke Corp. v. C & H Distributors	70C723 E.D. Wis.	CJ, DM	Mar. 8, 1971	
3,477,406	USA v. Marifarms Inc.	4306 D. Del 174 PQ 481.	motions DM	Dec. 26, 1972	
3,478,875	Roberts et al. v. Martin et al.	3080-N M.D. Ala.	DM	Apr. 15, 1971	
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3,480,984	Kidd Pipeline Inc. v. Rubber Applicators et al.	70 H 581 S.D. Tex.	DM w/p	Apr. 18, 1972	
3,481,123	MTD Prod. v. Black & Decker	C 70 918 N.D. Ohio	DM wo/p	Mar. 1971	
3,481,268	International Patents & Development Corp. v. Resources Control Corp. et al.	C 248-70 D.C.N.J.	DM	July 31, 1972	
3,482,324	Samhat v. Barton Tool & Engs. et al.	70 2545 EC C.D. Cal.	J, V & I Inj.	Apr. 23, 1971	
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3,484,888	Drackett Co. & Bristol Myers Co. v. Mack C. Davis.	176 PQ 344	NV	Dec. 13, 1972	
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3,485,312	Arctic Enterprises Inc. v. Meone Ambulance Service Inc. et al.	69 C 637 E.D. Wis.	CJ, VI	May 4, 1972	
3,485,517	Chicago Fittings Corp. v. Earl E. Howe et al.	69 C 2612 N.D. Ill.	DM	Mar. 4, 1970	
3,485,694	Cambridge Filter v. Arco Mfg.	70 C 1924 S.D.N.Y.	CJ, Inj.	Sept. 20, 1971	
3,486,127	Acromex Inc. v. Transmission Inc.	C 70 1199 N.D. Ohio.	V, I, CJ	Nov. 23, 1971	
3,487,221	Lase Co. v. Honeywell, Inc.	72 C 572 N.D. Ill.	DM w/p	June 12, 1972	
3,487,221	Lase Co. v. Intral Corp.	71 C 1010 N.D. Ill.	DM wo/p	Feb. 17, 1972	
3,487,535	Kysor Industrial Corp. v. Indexomatic Inc.	N 37792 E.D. Mich.	DM w/p	Dec. 1, 1972	
3,487,535	Kysor Industrial Corp. v. Supreme Tri-Bit Co.	N. 38759 E.D. Mich.	DM w/p	Nov. 30, 1972	
3,488,673	Poneil Bros. Inc. v. Nathan K. Morris, W. T. Grant Co.	176 PQ 353	nV	Dec. 29, 1972	
3,488,868	Stanley Works v. Oxwell Tool Co. Ltd.	72 C 438 E.D.N.Y.	CJ	Aug. 17, 1972	
3,489,154	International Playtex Corp. v. Bontec	13642 D. Conn.	CJ, Inj.	Feb. 2, 1971	
3,490,902	ARF Development et al. v. Huyck et al.	70 C 2461 N.D. Ill.	DM	Aug. 24, 1971	
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3,494,056	Grafika Commercial Arts Inc. v. Parisian Novelty Co. Inc. et al.	70 C 3216 N.D. Ill.	DM wo/p	May 17, 1971	
3,494,253	Metals Eng. Co. v. No. American Specialties Corp.	70 C 1517 E.D.N.Y.	DM w/p	Nov. 23, 1971	
3,494,352	Becton Dickinson v. Sherwood Ind.	175 PQ 337	nV, nI, F. lack of candor.	Sept. 11, 1972	
3,495,181	Reiffin v. Heathkit Electronic Center et al.	72 C 1812 N.D. Ill.	DM	Aug. 2, 1972	
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3,495,731	Jens Risom Design v. John E. Sjöström Co.	70 C1275 E.D.N.Y.	DM	Mar. 8, 1971	
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3,511,208	Jamajo Industries, Inc. v. Speegle- Moraney, Inc.	72-104 D.W. Okla.	DM.....	June 26, 1972	
3,512,338	Moss v. Nestle et al.....	71-252 W.D. Pa.	J for P.....	Aug. 30, 1971	
3,512,807	Switlik Parachute Co., Inc. v. Halkey- Roberts Corp.	1446-70 D.N.J.	DM.....	Jan. 19, 1972	
3,513,521	Royal Industries, Inc. v. Unique Machine Tool, Inc.	71-585 PHX D.C. Ariz.	DM.....		
3,513,718	Robin Prod. Co. v. Tomecek.....	36123 E.D. Mich.	DM.....	June 14, 1971	
3,514,834	Airtex Corp. v. Fine Line Bracing, Inc.....	14894 D. Conn.	DM.....	May 31, 1972	
3,515,087	Penn Yan Boats Inc. v. Sea Lark Boats Inc. et al.	71-S-Civ 175 PQ 260	nV, nl F misrep. of art	June 6, 1972	
3,517,405	Hanna v. Hurricane Car Wash System et al.	70-530 D Ariz.	cJl.....	Mar. 20, 1972	
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3,518,099	Holkins V. Edick Ind., Inc., et al.....	71-C-54 E.D. Wis.	CJ.....	Nov. 26, 1971	
3,518,604	Penn Yan Boats Inc. v. Sea Lark Boats Boats Inc. et al.	71-5-CIU-WMS.D. Fla.	V, l.....	June 6, 1972	
3,518,800	Connor Forest Industries v. Duo Lock Inc. et al.	70-C-450 ED Wis.	J, Inj.....	July 12, 1971	
3,520,056	General Electric Co. v. Rival Mfg. Co.....	19903-4 WD Mo.	DM.....	Dec. 30, 1971	
3,521,009	Gates Lear Jet v. Magnasyn Corp.....	173, PQ 203	DM.....	Feb. 25, 1972	
3,522,814	Safety-Klean Corp. v. Sortino.....	88-71C2 WD Wash.	Inj.....	Oct. 27, 1971	
3,525,793	Millmaster Onyx Corp. v. Lonza Inc.....	9000G1225	C, Inj.....	Dec. 21, 1972	
3,526,326	Supreme Equipment & Systems Corp. v. Atomic Development Corp. et al.	71C680 E.D.N.Y.	CJ.....	Dec. 3, 1971	
3,527,018	Vac-Air, Inc. v. John Mohr & Sons, Inc.	171PQ291	l.....	June 14, 1971	
3,530,017	Diversey Corp. v. Panther Chemical.....	CA41312 ND Tex.	CJ, Inj.....	May 6, 1971	
3,533,407	King Louie International, Inc., v. House of Champions Research.	C71-911 ND Ohio	Inj.....	Oct. 17, 1972	
3,534,490	Structural Industries Inc. v. Gerson Enterprises	72C24 ED. N.Y.	DM.....	Mar. 31, 1972	
3,534,576	Tronchemics Research, Inc., et al. v. Northrop Corp.	70-2471-ALS C.D. Calif.	DM.....	Nov. 20, 1972	
3,535,903	Tronchemics Research, Inc., et al. v. Northrop Corp.	70-2471-ALS C.D. Calif.	DM.....	Nov. 20, 1972	
3,536,144	Blackwell Steel Prods., Inc., v. Wed- ford Steel Prod., Inc.	71-440 W.D. Okla.	DM.....	Apr. 3, 1972	
3,538,389	Circuit-Stik, Inc. v. Bishop Graphics, Inc., et al.	70-2470-CC C.D. Calif.	DM, l.....	July 26, 1972	
3,538,389	Circuit Stik, Inc. v. International Rec- tifier Corp.	71-1086-CC C.D. Calif.	DM.....	July 26, 1972	
3,540,229	Bunten & Repco Prod., Corp. v. Wea- thermatic Corp.	71-1154-EC S.D. Fla. 176PQ231	nV.....	Nov. 16, 1972	
3,540,612	BioDynamics Inc. v. Serosonic Labs.....	71C1209 N.D. Ill.	V, l, Inj.....	Nov. 19, 1971	
3,543,098	American Plastics Co. v. Permonite Mfg. Co.	71C813 N.D. Ill.	DM.....	Dec. 7, 1972	
3,551,581	Sargent Ind. of Mich. Inc., v. Nu-Core Inc.	8950G779	Inj.....	Aug. 30, 1972	
3,552,051	Ritchey v. Fearing Mfg. Co., Inc.....	3-71CW277 D. Minn.	DM.....	Oct. 6, 1972	
3,553,374	Digitronics Corp. v. MSI Data Corp.....	898 OG 744	DM.....	Dec. 26, 1972	
3,556,391	Album Graphics, Inc., v. Buddah Rec- ords, Inc.	71C1521 S.D.N.Y.	DM.....	Sept. 10, 1971	
3,557,449	Popeil Bros. Inc. v. Nathan K. Morris, WT Grant Co.	176PQ353	nV.....	Dec. 29, 1972	
3,560,126	Gates Learjet Corp. v. Magnasyn Craig Corp.	173PQ203	V, l.....	Feb. 25, 1972	
3,560,979	General Aviation Electronics v. Van Dugen, Inc.	71-4-865 S.D. Tex.	CJ, V, l, Inj.....	Mar. 20, 1972	
3,561,146	Graphicana Corp. v. Baja Corp.....	36460 E.D. Mich.	SJ for Def.....	Mar. 20, 1972	
3,565,083	Popeil Bros. Inc. v. Aldens Inc.....	895 OG 392	nl.....	Nov. 14, 1972	
3,565,083	Popeil Bros. Inc. v. Sperry Rand Corp.	176PQ 101	nV, nl, M.....	Nov. 14, 1972	
3,568,853	A & H Mfg. Co. v. Novel Box Co. Inc.....	71C1456 E.D.N.Y.	DM.....	June 14, 1972	
3,584,402	Ortho Industries v. SH Camp & Co.....	38223 E.D. Mich.	CJ, Inj.....	Aug. 23, 1972	

Patent No.	Case	Citation	Decision	Date	Litigation in Patent Office
3, 585, 456	Unicorn Ind. v. Idaho Power Co.	1-71-71 D Idaho	DM	Oct. 15, 1971	
	Unicorn Ind. v. Goldy & Associates	71-302-CW S.D. Cal.	DM	Sept. 3, 1971	
	Unicorn Ind. v. McCreVan d/b/a Trailer Village.	71-304-N S.D. Cal.	DM	Oct. 4, 1971	
	Unicorn Ind. v. Hendsley d/b/a Trailer Village.	71-305-N S.D. Cal.	DM	Oct. 4, 1971	
	Unicorn Ind. v. Pearson d/b/a Trailer Village.	71-306-CW S.D. Cal.	DM	Oct. 4, 1971	
	Unicorn Ind. v. Fredericks d/b/a Trailer Village.	73-307-T S.D. Cal.	DM	Oct. 4, 1971	
	Unicorn Ind. v. Levins	71-309-T S.D. Cal.	DM	Sept. 8, 1971	
	Unicorn Ind. v. Heironimus	71-310-GT S.D. Cal.	DM	Sept. 3, 1971	
	Unicorn Ind. v. Mobile Parts West	71-312-T S.D. Cal.	DM	Sept. 3, 1971	
	Unicorn Ind. v. Helland	71-311-N S.D. Cal.	DM	Oct. 14, 1971	
	Unicorn Ind. v. Cohen et al.	71-313-N S.D. Cal.	DM	Sept. 3, 1971	
3, 585, 456	Unicorn Ind. v. Goldy et al.	71-381-CW S.D. Cal.	DM	Nov. 10, 1971	
3, 587, 619	Krechel v. Air Con. Inc., et al.	68-71 W.D. Pa.	DM	Apr. 26, 1972	
3, 588, 391	International Register Co. v. McGraw Edison Co.	72C964 N.D. Ill.	DM	June 9, 1972	
3, 590, 538	Superior Concrete Accessories v. Burke Concrete Accessories.	71C2142 N.D. Ill.	DM	July 13, 1972	
3, 598, 064	Belaco Inc. v. Adanco Metal Prod. Inc. et al.	71-1527 S.D. Fla.	DM	June 2, 1972	
3, 598, 088	Bowman et al. v. Lanier et al.	71-621 W.D. Okla.	Inj	Oct. 15, 1971	
3, 601, 385	Anson Auto. Engineering Inc. v. Gammell et al.	895 O.G. 392. 899 O.G. 821.	CJ, Inj	Apr. 3 1972	
3, 608, 208	Didactics Corp. v. The Welch Scien- tific Co.	W.D. Ohio Doc. C67-602.	Dm w/p	Sept. 1 1972	
3, 609, 679	Threshold Engineering Inc. v. Signal Lab. Inc.	901 O.G. 774	Dm	Dec. 5 1972	
3, 620, 432	Emery Co. Inc. v. Trujillo et al.	N.D. Ala. Doc. 1213-5.	Dm w o/p	May 10 1972	
3, 620, 909	Clark Products Inc. v. Waste Paper Reclamation Corp.	901 O.G. 774	Dm (strip. vol.)	May 24 1972	
3, 622, 980	Casell Co. v. Baader-Brown Mfg. Co.	902 O.G. T51	Dm (strip. vol.)	Aug. 31 1972	
3, 627, 037	Heat/Fluid Engineering Corp. v. R & R Engineering Co. Inc.	W. D. Okla. Doc. 72-C-141.	Inj	Dec. 14 1972	
3, 638, 833	Purex Corp., Ltd. v. Bio-Lab, Inc.	N.D. Ga. Doc. 17164.	Inj	Oct. 26 1972	
3, 673, 410	Isomedics, Inc. & Info. Utilization Corp. v. Bio Digital Sciences Inc.	D N.J. (Trenton) Doc. 1341-72.	Dm	Nov. 21 1972	
3, 675, 247	Tights Inc. v. Chadbourn, Inc.	W.D.N.C. Doc. C-C-72-234.	Dm w/p	Dec. 20 1972	
3, 678, 148	Isomedics, Inc. & Info. Utilization Corp. v. Bio Digital Sciences Inc.	D N.J. (Trenton) Doc. 1341-72.	Dm	Nov. 21 1972	

PATENT OFFICE REPLY TO SENATOR HART'S LETTER OF MARCH 19, 1973
Appendix D

D. COURT REVIEW OF PATENT OFFICE DECISIONS

Your letter also states:

"It would also be helpful if you would identify separately, for the past 5 years, the appeals taken to the C.C.P.A. and to the U.S. District Court for the District of Columbia, from the Board of Appeals or the Board of Interference Examiners. For each such appeal, please indicate the outcome of the case and whether or not the Patent Office position was upheld."

Attached herewith is a tabulation (Appendix D) of reported decisions of the Board of Appeals and the Board of Patent Interferences which were reviewed by either the Court of Customs and Patent Appeals or a district court during calendar years 1968 through 1972, inclusive.

Explanatory remarks

Although your request was directed specifically to district courts for the District of Columbia, in interference cases, civil actions under Section 146 are often taken in other district courts governed by the location of the winning party before the office. Accordingly, the tabulation includes all known civil actions regardless of the district court in which initiated.

The data is presented in four tables, which are identified as follows:

D. Table IA—Appeals from the Board of Appeals to the CCPA.

Table IB—Civil Actions in the U.S. District Court for the District of Columbia Following Decisions by the Board of Appeals.

Table IIA—Appeals from the Board of Interference Examiners to the CCPA.

Table IIB—Civil Action in the U.S. District Courts Following Decisions by the Board of Interference Examiners.

TABLE I.A.—APPEALS FROM THE BOARD OF APPEALS TO THE CCPA

Patent app. No.	Name of case	Decision date and citation	Disposition	Further review
7856	In re Eskild et al.....	Jan. 4, 1968, 156 USPQ 208.	Aff.....	
7808	In re Ornitz.....	Jan. 11, 1968, 156 USPQ 211.	Aff.....	
7850	In re Sabatino et al.....	Jan. 11, 1968, 156 USPQ 212.	Aff.....	
7874	In re Tierney et al.....	Jan. 11, 1968, 156 USPQ 248.	Aff.....	
7876	In re Zimmer.....	Jan. 11, 1968, 156 USPQ 252.	Aff.....	
7825	In re Rainer et al.....	Jan. 25, 1968, 156 USPQ 334.	Aff.....	
7835	In re Grosheim et al.....	Jan. 25, 1968, 156 USPQ 338.	Aff.....	
7884	In re Wynkoop et al.....	Feb. 8, 1968, 156 USPQ 458.	Rev.....	
7894	In re Rynkiewicz et al.....	Feb. 8, 1968, 156 USPQ 462.	Aff.....	
7811	In re Rauch.....	Feb. 15, 1968, 156 USPQ 502.	Aff.....	
7828	In re Peterson.....	Feb. 15, 1968, 156 USPQ 504.	Aff.....	
7854	In re Ziegler et al.....	Feb. 15, 1968, 156 USPQ 511.	Rev.....	
7889	In re Austin et al.....	Feb. 15, 1968, 156 USPQ 520.	Aff.....	
7911	In re LaChance.....	Feb. 21, 1968, 156 USPQ 562.	Aff.....	
7830	In re Harwood.....	Mar. 7, 1968, 156 USPQ 673.	Aff.....	
7867	In re Moore et al.....	Mar. 7, 1968, 156 USPQ 677.	Aff.....	
7875	In re Reven.....	Mar. 7, 1968, 156 USPQ 679.	Aff.....	
7885	In re Karnofsky.....	Mar. 7, 1968, 156 USPQ 682.	Rev.....	
7892	In re Bryant.....	Mar. 7, 1968, 156 USPQ 685.	Aff.....	
7857	In re Cummings.....	Mar. 14, 1968, 157 USPQ 47.	Aff. in Pt.....	
7870	In re Schulpen.....	Mar. 14, 1968, 157 USPQ 52.	Rev.....	
7895	In re Garvin.....	Apr. 4, 1968, 157 USPQ 190.	Aff.....	
7924	In re Koester et al.....	Apr. 4, 1968, 157 USPQ 220.	Aff.....	
7927	In re Da Fano.....	Apr. 4, 1968, 157 USPQ 192.	Aff. in Pt.....	
7947	In re Zalkind.....	Apr. 4, 1968, 157 USPQ 197.	Aff.....	
7901	In re Noznick et al.....	Apr. 11, 1968, 157 USPQ 266.	Aff.....	
7922	In re Meinhardt.....	Apr. 11, 1968, 157 USPQ 270.	Aff.....	
7933	In re Kohno.....	Apr. 11, 1968, 157 USPQ 275.	Aff.....	
7940	In re Andersen.....	Apr. 11, 1968, 157 USPQ 277.	Aff.....	
7824	In re Borg et al.....	Apr. 18, 1968, 157 USPQ 359.	Rev.....	
7905	In re Jentoft.....	Apr. 18, 1968, 157 USPQ 363.	Rev.....	
7846	In re Boylan.....	Apr. 25, 1968, 157 USPQ 370.	Rev.....	
7923	In re Carey.....	Apr. 25, 1968, 157 USPQ 376.	Aff.....	
7946	In re Myrtetus et al.....	Apr. 25, 1968, 157 USPQ 386.	Aff.....	

TABLE I.A.—APPEALS FROM THE BOARD OF APPEALS TO THE CCPA—Continued

Patent app. No.	Name of case	Decision date and citation	Disposition	Further review
7820	In re Eckel.....	May 2, 1968, 157 USPQ 415.	Rev.....	
7916	In re Sweet.....	May 2, 1968, 157 USPQ 495.	Aff. in Pt.....	
7939	In re Metcalf et al.....	May 2, 1968, 157 USPQ 423.	Aff.....	
7961	In re Warren et al.....	May 2, 1968, 157 USPQ 427.	Aff.....	
7968	In re Klossika et al.....	May 2, 1968, 157 USPQ 429.	Aff.....	
7888	In re Lawrence et al.....	May 9, 1968, 157 USPQ 500.	Aff.....	
7920	In re Marzocchi et al.....	May 9, 1968, 157 USPQ 504.	Aff.....	
7944	In re Soenksen et al.....	May 9, 1968, 157 USPQ 506.	Aff.....	
7950	In re Gidlow.....	May 9, 1968, 157 USPQ 509.	Aff.....	
7734	In re Smatko.....	May 16, 1968, 157 USPQ 514.	Aff.....	
7853	In re Wright.....	May 16, 1968, 157 USPQ 519.	Rev.....	
7860	In re Purdy.....	May 16, 1968, 157 USPQ 527.	Aff.....	
7909	In re Rogers.....	May 16, 1968, 157 USPQ 569.	Aff.....	
7941	In re Dike.....	May 16, 1968, 157 USPQ 581.	Aff. in Pt.....	
7953	In re Howard et al.....	May 16, 1968, 157 USPQ 615.	Aff.....	
7955	In re Swaim.....	May 16, 1968, 157 USPQ 618.	Aff.....	
7956	In re Johnson.....	May 16, 1968, 157 USPQ 620.	Aff. in Pt.....	
7396	In re Herrick et al.....	June 20, 1968, 158 USPQ 90.	Rev.....	
7893	In re Williams.....	May 23, 1968, 157 USPQ 623.	Rev.....	
7975	In re Sickbert.....	May 23, 1968, 157 USPQ 632.	Aff.....	
7908	In re Siegel et al.....	June 6, 1968, 158 USPQ 16.	Aff.....	
7912	In re Leonor.....	June 6, 1968, 158 USPQ 20.	Rev.....	
7945	In re Baranauckas et al.....	June 6, 1968, 158 USPQ 126.	Aff.....	
7969	In re Hayatian.....	June 6, 1968, 158 USPQ 29.	Aff.....	
7966	In re Beman.....	June 13, 1968, 158 USPQ 37.	Aff.....	
7967	In re Markert et al.....	June 13, 1968, 158 USPQ 39.	Aff.....	
7988	In re Giegerich et al.....	June 13, 1968, 158 USPQ 43.	Aff.....	
7943	In re Jezi et al.....	June 20, 1968, 158 USPQ 98.	Rev.....	
7996	In re Boettner.....	June 20, 1968, 158 USPQ 106.	Aff.....	
7883	In re Schneller.....	June 27, 1968, 158 USPQ 210.	Aff.....	
7864	In re Wiggins.....	June 27, 1968, 158 USPQ 199.	Rev.....	
7910	In re Hornoeh.....	June 27, 1968, 158 USPQ 140.	Rev.....	
7932	In re Klesper.....	June 27, 1968, 158 USPQ 256.	Aff.....	
7954	In re Bekey.....	June 27, 1968, 158 USPQ 260.	Rev.....	
7958	In re Cademartori.....	June 27, 1968, 158 USPQ 261.	Aff.....	
7962	In re Gale.....	June 27, 1968, 158 USPQ 263.	Aff.....	
7973	In re Collier.....	June 27, 1968, 158 USPQ 266.	Aff.....	
7980	In re Lemelson.....	June 27, 1968, 158 USPQ 275.	Aff.....	
7984	In re Fee et al.....	June 27, 1968, 158 USPQ 277.	Aff.....	

TABLE I.A.—APPEALS FROM THE BOARD OF APPEALS TO THE CCPA—Continued

Patent app. No.	Name of case	Decision date and citation	Disposition	Further review
7989	In re Smith.....	June 27, 1968, 158 USPQ 287.	Aff.....	
7998	In re Denny et al.....	June 27, 1968, 158 USPQ 292.	Aff.....	
7935	In re Aldrich.....	July 3, 1968, 158 USPQ 311.	Rev.....	
7963	In re Naquin.....	July 3, 1968, 158 USPQ 317.	Rev.....	
7964	In re Kamal et al.....	July 3, 1968, 158 USPQ 320.	Rev.....	
7971	In re Mergner.....	July 3, 1968, 158 USPQ 324.	Rev.....	
7974	In re Plank et al.....	July 3, 1968, 158 USPQ 328.	Rev.....	
7978	In re Kanter.....	July 3, 1968, 158 USPQ 331.	Aff.....	
7985	In re Cahn et al.....	July 3, 1968, 158 USPQ 334.	Aff.....	
7990	In re Harris.....	July 3, 1968, 158 USPQ 338.	Aff.....	
8107	In re Henriksen.....	July 3, 1968, 158 USPQ 224.	Rev.....	
7934	In re Aufhauser.....	July 18, 1968, 158 USPQ 351.	Rev.....	
8004	In re Myers.....	Oct. 24, 1968, 159 USPQ 339.	Aff.....	
8016	In re Preda.....	Oct. 24, 1968, 159 USPQ 342.	Aff.....	
7970	In re Petrow et al.....	Nov. 7, 1968, 159 USPQ 449.	Rev.....	
8000	In re Land.....	Nov. 14, 1968, 159 USPQ 532.	Aff.....	
7987	In re Prater et al.....	Nov. 20, 1968, 162 USPQ 541.	Rev.....	
8006	In re Doebl et al.....	Nov. 27, 1968, 159 USPQ 642.	Aff.....	
8025	In re Eckel.....	Nov. 27, 1968, 159 USPQ 644.	Aff.....	
8030	In re DuPuis.....	Nov. 27, 1968, 159 USPQ 646.	Aff.....	
8034	In re Ellms.....	Nov. 27, 1968, 159 USPQ 647.	Aff.....	
8011	In re Miegel et al.....	Dec. 5, 1968, 159 USPQ 716.	Aff.....	
8021	In re Yawata Iron & Steel Co.....	Dec. 5, 1968, 159 USPQ 721.	Aff.....	
8027	In re Nielsen.....	Dec. 5, 1968, 159 USPQ 723.	Aff.....	
8058	In re Young et al.....	Dec. 5, 1968, 159 USPQ 725.	Aff.....	
8083	In re Jureit.....	Dec. 5, 1968, 159 USPQ 728.	Aff.....	
7812	In re Bartholome et al.....	Dec. 7, 1968, 156 USPQ 20.	Rev.....	
8026	In re Umbricht.....	Dec. 12, 1968, 160 USPQ 15.	Rev.....	
8013	In re Broadley.....	Dec. 19, 1968, 160 USPQ 38.	Rev.....	
7851	In re Moran et al.....	Dec. 28, 1968, 156 USPQ 149.	Aff.....	
8022	In re Casey.....	Jan. 9, 1969, 160 USPQ 189.	Aff.....	
8064	In re Crabb et al.....	Jan. 9, 1969, 160 USPQ 197.	Aff.....	
8069	In re Hamilton.....	Jan. 9, 1969, 160 USPQ 199.	Aff.....	
8007	In re Sponnoble.....	Jan. 16, 1969, 160 USPQ 237.	Rev.....	
8018	In re Booth.....	Jan. 16, 1969, 160 USPQ 328.	Aff.....	
8020	In re Woolery.....	Jan. 16, 1969, 160 USPQ 331.	Aff.....	
8044	In re Fuchsman.....	Jan. 16, 1969, 160 USPQ 404.	Aff. in Pt.....	
8053	In re Durbin et al.....	Jan. 16, 1969, 160 USPQ 408.	Aff.....	
8076	In re White et al.....	Jan. 16, 1969, 160 USPQ 417.	Rev.....	
8062	In re Conix et al.....	Jan. 23, 1969, 160 USPQ 420.	Aff.....	

TABLE I.A.—APPEALS FROM THE BOARD OF APPEALS TO THE CCPA—Continued

Patent app. No.	Name of case	Decision date and citation	Disposition	Further review
8090	In re Weber et al.....	Feb. 2, 1969, 160 USPQ 549.	Aff in Pt.....	
8066	In re Osswald.....	Feb. 6, 1969, 160 USPQ 545.	Aff.....	
8079	In re Morin.....	Feb. 6, 1969, 160 USPQ 548.	Aff.....	
8075	In re Brown et al.....	Feb. 20, 1969, 160 USPQ 669.	Aff.....	
8087	In re Farmer.....	Feb. 20, 1969, 160 USPQ 671.	Aff.....	
8091	In re Melchiorre et al.....	Feb. 20, 1969, 160 USPQ 672.	Aff.....	
8033	In re Gladrow et al.....	Feb. 27, 1969, 160 USPQ 674.	Aff. in Pt.....	
8112	In re Mullikin.....	Feb. 27, 1969, 160 USPQ 683.	Aff.....	
8072	In re Hoffman.....	Mar. 6, 1969, 160 USPQ 726.	Aff.....	
8098	In re Umbarger.....	Mar. 6, 1969, 160 USPQ 734.	Aff.....	
8100	In re Jacobson.....	Mar. 6, 1969, 160 USPQ 795.	Aff.....	
8106	In re Cormany et al.....	Mar. 6, 1969, 160 USPQ 801.	Rev.....	
8109	In re Seifried et al.....	Mar. 6, 1969, 160 USPQ 804.	Aff.....	
8111	In re deLisle.....	Mar. 6, 1969, 160 USPQ 806.	Aff.....	
8118	In re Hoeschele.....	Mar. 6, 1969, 160 USPQ 809.	Aff.....	
8060	In re Stiles.....	Apr. 3, 1969, 161 USPQ 210.	Rev.....	
8104	In re Tutthill.....	Apr. 3, 1969, 161 USPQ 214.	Aff.....	
8125	In re Chitayat.....	Apr. 3, 1969, 161 USPQ 224.	Aff.....	
8139	In re Hill.....	Apr. 3, 1969, 161 USPQ 229.	Aff.....	
8008	In re Mathews.....	Apr. 10, 1969, 161 USPQ 276.	Rev.....	
8065	In re Mod et al.....	Apr. 10, 1969, 161 USPQ 281.	Aff.....	
8127	In re Lemin et al.....	Apr. 10, 1969, 161 USPQ 288.	Aff. in Pt.....	
8138	In re Harrington et al.....	Apr. 10, 1969, 161 USPQ 291.	Aff.....	
8238	In re Facius.....	Apr. 10, 1969, 161 USPQ 294.	Aff.....	
8061	In re Moore.....	Apr. 17, 1969, 161 USPQ 343.	Aff.....	
8101	In re Dorsky et al.....	Apr. 17, 1969, 161 USPQ 349.	Rev.....	
8115	In re Bretsch.....	Apr. 17, 1969, 161 USPQ 352.	Aff.....	
8135	In re Moberg.....	Apr. 17, 1969, 161 USPQ 356.	Aff.....	
8137	In re Richman.....	Apr. 17, 1969, 161 USPQ 359.	Rev.....	
8067	In re Steinhauer et al.....	May 15, 1969, 161 USPQ 595.	Rev.....	
8119	In re Arakelian.....	May 15, 1969, 161 USPQ 604.	Aff.....	
8148	In re Deters.....	May 15, 1969, 161 USPQ 610.	Aff.....	
8152	In re Fancher et al.....	May 15, 1969, 161 USPQ 613.	Aff.....	
8035	In re Myers.....	May 22, 1969, 161 USPQ 668.	Aff. in Pt.....	
8121	In re Jursich et al.....	May 22, 1969, 161 USPQ 675.	Aff.....	
8170	In re Jureit.....	May 22, 1969, 161 USPQ 731.	Aff.....	
8171	In re Jureit.....	May 29, 1969, 161 USPQ 731.	Aff.....	
8176	In re Pack et al.....	May 29, 1969, 161 USPQ 734.	Aff. in Pt.....	
8123	In re Beckmann et al.....	June 5, 1969 161 USPQ 780.	Aff.....	

TABLE I.A.—APPEALS FROM THE BOARD OF APPEALS TO THE CCPA—Continued

Patent app. No.	Name of case	Decision date and citation	Disposition	Further review
8126	In re Hafner.....	June 5, 1969, 161 USPQ 783.	Aff.....	
8133	In re Handrick.....	June 5, 1969, 161 USPQ 787.	Aff.....	
8158	In re Metcalfe et al.....	June 5, 1969, 161 USPQ 789.	Rev.....	
8130	In re Van Venrooy et al.....	June 12, 1969, 162 USPQ 37.	Aff.....	
8092	In re Tarbox.....	June 19, 1969, 162 USPQ 90.	Aff.....	
8140	In re Charvat.....	June 19, 1969, 162 USPQ 95.	Aff.....	
8150	In re Maloney.....	June 19, 1969, 162 USPQ 98.	Aff.....	
8161	In re Zierden.....	June 19, 1969, 162 USPQ 102.	Aff. in Pt.....	
8052	In re Pilkington.....	June 26, 1969, 162 USPQ 145.	Rev.....	
8142	In re Craig et al.....	June 26, 1969, 162 USPQ 157.	Rev.....	
8146	In re Hotten.....	June 26, 1969, 162 USPQ 160.	Rev.....	
8157	In re Frilette et al.....	June 26, 1969, 162 USPQ 163.	Aff.....	
8165	In re Land.....	June 26, 1969, 162 USPQ 210.	Rev.....	
8172	In re Garnero.....	June 26, 1969, 162 USPQ 221.	Rev.....	
8099	In re Jones.....	July 3, 1969, 162 USPQ 224.	Aff.....	
8159	In re Flint.....	July 3, 1969, 162 USPQ 228.	Rev.....	
8164	In re Carlson.....	July 3, 1969, 162 USPQ 233.	Aff.....	
8181	In re Durfee et al.....	July 17, 1969 162 USPQ 359.	Aff.....	
8166	In re Anthony.....	Sept. 11, 1969, 162 USPQ 594.	Aff. in Pt.....	
8167	In re Newton.....	Sept. 18, 1969, 163 USPQ 34.	Rev.....	
8189	In re McGuire et al.....	Oct. 23, 1969, 163 USPQ 417.	Aff.....	
8179	In re DeJong.....	Oct. 30, 1969, 163 USPQ 479.	Rev.....	
8173	In re Bozek.....	Nov. 6, 1969, 163 USPQ 545.	Aff.....	
8177	In re Ferens.....	Nov. 20, 1969, 163 USPQ 609.	Aff.....	
8187	In re Bernhart et al.....	Nov. 20, 1969, 163 USPQ 611.	Aff. in Pt.....	
8199	In re Kocina.....	Nov. 20, 1969, 163 USPQ 622.	Aff.....	
8200	In re Novak.....	Nov. 26, 1969, 163 USPQ 651.	Aff.....	
8186	In re Muller.....	Nov. 26, 1969, 163 USPQ 641.	Rev.....	
8188	In re Thorington et al.....	Nov. 26, 1969, 163 USPQ 644.	Aff.....	
8201	In re Vaughan.....	Dec. 4, 1969, 163 USPQ 682.	Aff.....	
8210	In re Buting.....	Dec. 4, 1969, 163 USPQ 689.	Aff.....	
8213	In re Betz.....	Dec. 4, 1969, 163 USPQ 691.	Aff.....	
8124	In re Cummings et al.....	Dec. 11, 1969, 164 USPQ 18.	Aff in Pt.....	
8185	In re Benson et al.....	Dec. 11, 1969, 164 USPQ 22.	Rev.....	
8212	In re Miller.....	Dec. 18, 1969, 164 USPQ 46.	Rev.....	
8202	In re Doak et al.....	Dec. 31, 1969, 164 USPQ 128.	Aff.....	
8223	In re Doll.....	Jan. 8, 1970, 164 USPQ 219.	Rev.....	
8230	In re Lemin.....	Jan. 8, 1970, 164 USPQ 205.	Aff. in Pt.....	
8237	In re Eltgroth.....	Jan. 8, 1970, 164 USPQ 221.	Aff.....	

TABLE I.A.—APPEALS FROM THE BOARD OF APPEALS TO THE CCPA—Continued

Patent app. No.	Name of case	Decision date and citation	Disposition	Further review
8234	In re Reni.....	Jan. 15, 1970, 164 USPQ 245.	Rev.....	
8239	In re Brink.....	Jan. 15, 1970, 164 USPQ 247.	Rev.....	
8180	In re Snoddy et al.....	Jan. 22, 1970, 194 USPQ 299.	Rev.....	
8226	In re Bezombes et al.....	Feb. 5, 1970, 164 USPQ 387.	Aff. in Pt.....	
8244	In re Bezombes.....	Feb. 5, 1970, 164 USPQ 387.	Aff. in Pt.....	
8219	In re Whiton.....	Feb. 12, 1970, 164 USPQ 455.	Rev.....	
8235	In re Nelson.....	Feb. 12, 1970, 164 USPQ 458.	Aff.....	
8249	In re Estes.....	Feb. 19, 1970, 164 USPQ 519.	Rev.....	
8216	In re Mahoney.....	Feb. 26, 1970, 164 USPQ 572.	Rev.....	
8250	In re Schilling.....	Feb. 26, 1970, 164 USPQ 576.	Aff.....	
8198	In re Vogel et al.....	Mar. 5, 1970, 164 USPQ 619.	Aff. in Pt.....	
8211	In re Searles.....	Mar. 5, 1970, 164 USPQ 623.	Aff. & Rem.....	
8270	In re Szajan et al.....	Mar. 5, 1970, 164 USPQ 632.	Aff. in Pt.....	
8192	In re Wakefield.....	Mar. 12, 1970, 164 USPQ 636.	Aff. in Pt.....	
8214	In re Borkowski et al.....	Mar. 12, 1970, 164 USPQ 642.	Aff. in Pt.....	
8280	In re Halleck.....	Mar. 12, 1970, 164 USPQ 647.	Rev.....	
8263	In re Phelps.....	Mar. 19, 1970, 165 USPQ 65.	Aff.....	
8265	In re Thompson.....	Mar. 19, 1970, 165 USPQ 69.	Aff.....	
8303	In re Melin.....	Mar. 26, 1970, 165 USPQ 168.	Aff.....	
8191	In re Hilmer et al.....	Apr. 9, 1970, 165 USPQ 255.	Rev.....	
8267	In re Friette.....	Apr. 9, 1970, 165 USPQ 259.	Rev. & Rem.....	
8276	In re Visnansky.....	Apr. 9, 1970, 165 USPQ 262.	Aff.....	
8258	In re Paquette.....	Apr. 16, 1970, 165 USPQ 317.	Aff.....	
8291	In re Mochel.....	Apr. 16, 1970, 165 USPQ 319.	Aff.....	
8293	In re Massoubre.....	Apr. 16, 1970, 165 USPQ 322.	Rev.....	
8310	In re Weil.....	Apr. 16, 1970, 165 USPQ 324.	Aff.....	
8246	In re Petrzilka et al.....	Apr. 23, 1970, 165 USPQ 327.	Rev.....	
8297	In re Braun et al.....	Apr. 23, 1970, 165 USPQ 329.	Aff.....	
8232	In re Ahlert et al.....	Apr. 30, 1970, 165 USPQ 418.	Aff.....	
8254	In re Stroszynski.....	Apr. 30, 1970, 165 USPQ 438.	Aff.....	
8272	In re Walsh et al.....	Apr. 30, 1970, 165 USPQ 442.	Rev.....	
8271	In re Wilson.....	May 7, 1970, 165 USPQ 494.	Rev.....	
8277	In re Seyb.....	May 7, 1970, 165 USPQ 507.	Aff.....	
8281	In re Richman.....	May 7, 1970, 165 USPQ 509.	Aff. in Pt.....	
8314	In re Milligan.....	May 7, 1970, 166 USPQ 41.	Aff.....	
8196	In re Geiger et al.....	May 14, 1970, 165 USPQ 572.	Rev.....	
8215	In re Freed.....	May 14, 1970, 165 USPQ 570.	Rev.....	
8222	In re Kuderna et al.....	May 14, 1970, 165 USPQ 575.	Rev.....	
8257	In re Golner.....	May 14, 1970, 165 USPQ 546.	Aff.....	
8315	In re Randol et al.....	May 14, 1970, 165 USPQ 586.	Rev.....	

TABLE I.A.—APPEALS FROM THE BOARD OF APPEALS TO THE CCPA—Continued

Patent app. No.	Name of case	Decision date and citation	Disposition	Further review
8282	In re Sandmeyer.....	May 21, 1970, 165 USPQ 629.	Aff.....	
8247	In re Hakala.....	May 28, 1970, 165 USPQ 704.	Aff.....	
8301	In re Ruegg.....	May 28, 1970, 165 USPQ 711.	Aff.....	
8318	In re Bodley.....	May 28, 1970, 165 USPQ 714.	Aff.....	
8319	In re Passal et al.....	May 28, 1970, 165 USPQ 702.	Aff.....	
8327	In re Passal.....	May 28, 1970, 165 USPQ 720.	Aff.....	
8208	In re Fisher.....	June 11, 1970, 166 USPQ 18.	Aff.....	
8298	In re Irani et al.....	June 11, 1970, 166 USPQ 24.	Rev.....	
8325	In re Van Dyke.....	June 11, 1970, 166 USPQ 27.	Aff.....	
8305	In re Prengle et al.....	June 18, 1970, 166 USPQ 31.	Aff.....	
8324	In re Collier.....	June 18, 1970, 166 USPQ 44.	Aff.....	
8289	In re Bindshedler.....	June 25, 1970, 166 USPQ 75.	Aff.....	
8300	In re Skrivan.....	June 25, 1970, 166 USPQ 85.	Rev.....	
8311	In re Gardner et al.....	June 25, 1970, 166 USPQ 138.	Aff.....	
8339	In re Vogel.....	June 25, 1970, 166 USPQ 144.	Aff.....	
8278	In re Hammack.....	July 2, 1970, 166 USPQ 204.	Aff.....	
8284	In re Hammack.....	July 2, 1970, 166 USPQ 209.	Aff.....	
8338	In re Charvat.....	July 9, 1970, 166 USPQ 326.	Aff.....	
8256	In re Bergstrom.....	July 16, 1970, 166 USPQ 256.	Rev.....	
8336	In re Godron.....	July 23, 1970, 166 USPQ 327.	Rev.....	
8323	In re Hoch.....	July 30, 1970, 166 USPQ 406.	Aff.....	
8342	In re Stepanek.....	July 30, 1970, 166 USPQ 409.	Aff.....	
8194	In re Wilder.....	Aug. 13, 1970, 166 USPQ 545.	Aff. in Pt.....	
8287	In re Castaing.....	Aug. 13, 1970, 166 USPQ 550.	Rev.....	
8313	In re Robins.....	Aug. 13, 1970, 166 USPQ 552.	Aff. in Pt.....	
8283	In re Hostettler et al.....	Aug. 20, 1970, 166 USPQ 558.	Aff.....	
8316	In re Moore.....	Sept. 3, 1970, 166 USPQ 563.	Aff.....	
8292	In re Musgrave.....	Oct. 8, 1970, 167 USPQ 280.	Rev.....	
8372	In re Katz.....	Nov. 5, 1970, 167 USPQ 487.	Aff.....	
8371	In re Persinski.....	Nov. 19, 1970, 167 USPQ 633.	Aff.....	
8312	In re Heldt.....	Nov. 25, 1970, 167 USPQ 676.	Aff.....	
8356	In re Muchmore.....	Nov. 25, 1970, 167 USPQ 681.	Aff.....	
8360	In re Brower.....	Nov. 25, 1970, 167 HSPQ 684.	Rev.....	
8377	In re Houghton.....	Nov. 25, 1970, 167 USPQ 687.	Aff.....	
8374	In re Irish.....	Dec. 3, 1970, 167 USPQ 764.	Rev.....	
8359	In re Frantz.....	Dec. 10, 1970, 168 USPQ 40.	Aff.....	
8365	In re Meunier.....	Dec. 10, 1970, 168 USPQ 43.	Rev.....	
8368	In re Yale.....	Dec. 10, 1970, 168 USPQ 46.	Rev.....	
8389	In re Gardner.....	Dec. 10, 1970, 168 USPQ 49.	Aff.....	

TABLE I.A.—APPEALS FROM THE BOARD OF APPEALS TO THE CCPA—Continued

Patent app. No.	Name of case	Decision date and citation	Disposition	Further review
8347	In re Argoudelis et al.	Dec. 17, 1970, 168 USPQ 99.	Rev.	
8373	In re Adams et al.	Dec. 17, 1970, 168 USPQ 105.	Aff.	
8369	In re Gewiss.	Jan. 7, 1971, 168 USPQ 280.	Aff.	
8373	In re Shearman.	Jan. 7, 1971, 168 USPQ 284.	Aff. in Pt.	
8408	In re Johnson.	Jan. 7, 1971, 168 USPQ 289.	Aff.	
8411	In re Swidzinski.	Jan. 7, 1971, 168 USPQ 292.	Aff.	
8417	In re Ahlbrecht.	Jan. 7, 1971, 168 USPQ 293.	Aff.	
8370	In re Touvay.	Jan. 14, 1971, 168 USPQ 357.	Aff.	
8386	In re Andrews.	Jan. 14, 1971, 168 USPQ 360.	Aff. in Pt.	
8387	In re Andrews.	Jan. 14, 1971, 168 USPQ 360.	Aff.	
8395	In re Strabala.	Jan. 14, 1971, 168 USPQ 367.	Aff.	
8399	In re Andrews.	Jan. 14, 1971, 168 USPQ 360.	Aff. in Pt.	
8400	In re Frilette et al.	Jan. 14, 1971, 168 USPQ 368.	Rev.	
8420	In re Stryker.	Jan. 14, 1971, 168 USPQ 372.	Rev.	
8414	In re Cavanagh.	Jan. 28, 1971, 168 USPQ 466.	Aff.	
8418	In re Jacuzzi.	Feb. 4, 1971, 168 USPQ 526.	Rev.	
8425	In re Finsterwalder.	Feb. 4, 1971, 168 USPQ 530.	Aff.	
8358	In re Donaldson.	Feb. 11, 1971, 168 USPQ 575.	Aff.	
8367	In re Gibbs.	Feb. 11, 1971, 168 USPQ 578.	Rev.	
8381	In re Kennedy.	Feb. 11, 1971, 168 USPQ 587.	Aff.	
8402	In re DiLeone et al.	Feb. 11, 1971, 168 USPQ 592.	Rev.	
8403	In re Landgraf.	Feb. 11, 1971, 168 USPQ 595.	Aff.	
8410	In re DiLeone.	Feb. 11, 1971, 168 USPQ 598.	Aff.	
8421	In re Garfinkel.	Feb. 18, 1971, 168 USPQ 659.	Aff.	
8423	In re Garfinkel.	Feb. 18, 1971, 168 USPQ 662.	Aff.	
8438	In re Sellman.	Feb. 18, 1971, 168 USPQ 665.	Aff.	
8422	In re Sheckler.	Feb. 25, 1971, 168 USPQ 716.	Aff.	
8450	In re Marsheck.	Feb. 25, 1971, 168 USPQ 721.	Aff.	
8419	In re Cother.	Mar. 4, 1971, 168 USPQ 773.	Aff.	
8445	In re Feinberg.	Mar. 4, 1971, 168 USPQ 777.	Aff.	
8435	In re Thompson.	Mar. 11, 1971, 169 USPQ 35.	Aff.	
8447	In re Krank et al.	Mar. 11, 1971, 169 USPQ 41.	Aff.	
8457	In re Riddle et al.	Mar. 11, 1971, 169 USPQ 45.	Aff.	
8467	In re Van Beckum et al.	Mar. 11, 1971, 169 USPQ 47.	Aff.	
8470	In re Lerner.	Mar. 11, 1971, 169 USPQ 51.	Aff.	
8357	In re Cohn.	Mar. 18, 1971, 169 USPQ 95.	Aff.	
8432	In re Foster et al.	March 18, 1971, 169 USPQ 99.	Aff. in Pt.	
8452	In re Ahlert et al.	March 18, 1971, 169 USPQ 102.	Aff.	
8494	In re Conrad.	March 25, 1971, 169 USPQ 170.	Aff.	
8396	In re Swinehart et al.	April 1, 1971, 169 USPQ 226.	Rev.	

TABLE I.A.—APPEALS FROM THE BOARD OF APPEALS TO THE CCPA—Continued

Patent app. No.	Name of case	Decision date and citation	Disposition	Further review
8398	In re Boon.....	April 1, 1971, 169 USPQ 231.	Aff. in Pt. & Rem.	
8428	In re Moore et al.....	April 1, 1971, 169 USPQ 236.	Rev.....	
8489	In re Booregard.....	April 1, 1971, 169 USPQ 240.	Aff.....	
8446	In re Cook et al.....	April 8, 1971, 169 USPQ 298.	Aff.....	
8460	In re D'Ancicco et al.....	April 8, 1971, 169 USPQ 303.	Aff.....	
8465	In re Wilson.....	April 8, 1971, 169 USPQ 307.	Aff.....	
8431	In re Marzocchi et al.....	April 15, 1971, 169 USPQ 367.	Aff. in Pt.....	
8392	In re Susi.....	April 22, 1971, 169 USPQ 423.	Aff.....	
8478	In re Russell.....	April 22, 1971, 169 USPQ 426.	Rev.....	
8484	In re Fouche.....	April 22, 1971, 169 USPQ 429.	Af. in Pt.....	
8345	In re Hengehold.....	April 29, 1971, 169 USPQ 473.	Aff.....	
8451	In re Edwards et al.....	April 29, 1971, 169 USPQ 480.	Aff.....	
8456	In re Esterhoy et al.....	April 29, 1971, 169 USPQ 483.	Rev.....	
8468	In re Orfeo et al.....	April 29, 1971, 169 USPQ 31.	Rev.....	
8376	In re Benson et al.....	May 6, 1971, 169 USPQ 548.	Rev.....	Pet. Cert No. 71-485 Rev. 11/20/72 [175 USPQ 673] (P.O. position upheld).
8495	In re Barrett et al.....	May 6, 1971, 169 USPQ 560.	Rev.....	
8513	In re Ludtke et al.....	May 6, 1971, 169 USPQ 563.	Aff.....	
8444	In re Miller.....	May 13, 1971, 169 USPQ 597.	Rev.....	
8454	In re Fisher.....	May 13, 1971, 169 USPQ 602.	Rev.....	
8458	In re Ghiron et al.....	May 20, 1971, 169 USPQ 723.	Aff.....	
8481	In re Lindberg.....	May 20, 1971, 169 USPQ 728.	Rev.....	
8523	In re Gardner.....	May 20, 1971, 169 USPQ 730.	Aff.....	
8505	In re Facer.....	May 27, 1971, 169 USPQ 794.	Aff.....	
8506	In re Facer.....	May 27, 1971, 169 USPQ 794.	Aff.....	
8507	In re Facer.....	May 27, 1971, 169 USPQ 794.	Aff.....	
8517	In re Lukach et al.....	May 27, 1971, 169 USPQ 795.	Aff.....	
8534	In re McIlroy.....	May 27, 1971, 170 USPQ 31.	Rev.....	
8535	In re Fruengel.....	May 27, 1971, 169 USPQ 802.	Aff. in Pt.....	
8536	In re Rarey.....	June 3, 1971, 170 USPQ 38.	Aff.....	
8471	In re Lewis.....	June 10, 1971, 170 USPQ 84.	Aff.....	
8502	In re Tiffin et al.....	June 10, 1971, 170 USPQ 88.	Rev.....	
8526	In re Reynolds.....	June 10, 1971, 170 USPQ 94.	Aff. in Pt.....	
8405	In re Ziegler et al.....	June 17, 1971, 170 USPQ 129.	Aff.....	
8474	In re McLaughlin.....	June 24, 1971, 170 USPQ 209.	Aff. in Pt.....	
8500	In re Saunders et al.....	June 24, 1971, 170 USPQ 213.	Aff. in Pt.....	
8501	In re Vasseur et al.....	June 24, 1971, 170 USPQ 221.	Aff.....	
8437	In re Moore.....	July 1, 1971, 170 USPQ 260.	Rev.....	
8466	In re Oda et al.....	July 1, 1971, 170 USPQ 268.	Rev.....	

TABLE I.A.—APPEALS FROM THE BOARD OF APPEALS TO THE CCPA—Continued

Patent app. No.	Name of case	Decision date and citation	Disposition	Further review
8479	In re Pitt et al.	July 1, 1971, 170 USPQ 260.	Rev.	
8519	In re Talbott	July 1, 1971, 170 USPQ 281.	Aff.	
8537	In re Dahlgren	July 1, 1971, 170 USPQ 282.	Aff. in Pt.	
8538	In re Antle	July 1, 1971, 170 USPQ 285.	Aff.	
8429	In re Barr et al.	July 8, 1971, 170 USPQ 330.	Aff. in Pt.	
8518	In re Ackermann et al.	July 8, 1971, 170 USPQ 340.	Rev.	
8434	In re Stemniski	July 15, 1971, 170 USPQ 343.	Rev.	
8544	In re Takai	November 4, 1971, 171 USPQ 558.	Aff.	
8545	In re Andrews	November 4, 1971, 171 USPQ 560.	Aff.	
8546	In re Fenton	Nov. 11, 1971, 171 USPQ 693.	Aff.	
8561	In re Lurie	Nov. 18, 1971, 171 USPQ 758.	Aff.	
8575	In re Swett	Dec. 9, 1971, 172 USPQ 72.	Rev.	
8552	In re Cavrich	Dec. 16, 1971, 172 USPQ 121.	Aff.	
8569	In re Kaufmann et al.	Dec. 16, 1971, 172 USPQ 124.	Aff.	
8586	In re Lapworth	Dec. 16, 1971, 172 USPQ 129.	Aff.	
8599	In re Ernst	Dec. 30, 1971, 172 USPQ 236.	Aff.	
8555	In re Lewis	Jan. 6, 1972, 172 USPQ 238.	Aff.	
8566	In re D'ancicco et al.	Jan. 6, 1972 172 USPQ 241.	Aff.	
8562	In re Kamm et al.	Jan. 13, 1972, 172 USPQ 298.	Rev.	
8617	In re Hyson	Jan. 27, 1972, 172 USPQ 399.	Aff.	
8635	In re Stark	Jan. 27, 1972 172 USPQ 402.	Rev.	
8547	In re Hirshon et al.	Feb. 3, 1972 172 USPQ 436.	Aff.	
8580	In re MacLean et al.	Feb. 10, 1972, 172 USPQ 494.	Aff.	
8553	In re Arkley et al.	Feb. 17, 1972, 172 USPQ 524.	Rev.	
8577	In re Mantell et al.	Feb. 17, 1972, 172 USPQ 530.	Aff. in Pt.	
8641	In re Willis	Mar. 3, 1972, 172 USPQ 667.	Rev.	
8565	In re Pratt et al.	Mar. 9, 1972, 173 USPQ 11.	Aff.	
8582	In re Klosak	Mar. 9, 1972, 173 USPQ 14.	Aff.	
8642	In re Mraz	Mar. 9, 1972, 173 USPQ 25.	Aff.	
8666	In re Malin	Mar. 9, 1972, 173 USPQ 28.	Aff.	
8600	In re Whittle	Feb. 17, 1972 172 USPQ 535.	Aff.—Rehearing denied Mar. 23, 1972.	
8627	In re Brebner	Mar. 23, 1972, 173 USPQ 169.	Rev.	
8638	In re Locher	Mar. 23, 1972, 173 USPQ 172.	Aff.	
8683	In re Glass	Mar. 23, 1972, 173 USPQ 166.	Aff.	
8654	In re Marzocchi	Mar. 30, 1972, 173 USPQ 228.	Aff.	
8670	In re Chamot	Mar. 30, 1972, 173 USPQ 231.	Aff.	
8684	In re Lindner	Apr. 6, 1972, 173 USPQ 356.	Aff.	
8587	In re Van Langenhoven	Apr. 20, 1972, 173 USPQ 426.	Aff.	

TABLE I.A.—APPEALS FROM THE BOARD OF APPEALS TO THE CCPA—Continued

Patent app. No.	Name of case	Decision date and citation	Disposition	Further review
8619	In re Waldbaum.....	Apr. 20, 1972, 173 USPQ 430.	Rev.....	
8570	In re Graves.....	Apr. 30, 1972, 173 USPQ 423.	Aff.....	
8718	In re Lintner.....	May 4, 1972 173 USPQ 560.	Aff.....	
8629	In re DeLucia.....	May 11, 1972, 173 USPQ 668.	Aff.....	
8634	In re Russell.....	May 11, 1972, 173 USPQ 671.	Aff.....	
8701	In re Short.....	May 11, 1972, 173 USPQ 678.	Aff.....	
8590	In re Smith.....	May 18, 1972, 173 USPQ 679.	Aff.....	
8621	In re Brown et al.....	May 18, 1972, 173 USPQ 685.	Aff. in Pt.....	
8757	In re Hausmann.....	May 18, 1972, 173 USPQ 691.	Aff.....	
8720	In re Pinten et al.....	June 1, 1972, 173 USPQ 801.	Aff. in Pt.....	
8689	In re Simon.....	June 8, 1972, 173 USPQ 114.	Aff.....	
8723	In re Mattox et al.....	June 15, 1972, 174 USPQ 155.	Aff.....	
8727	In re Doebel et al.....	June 15, 1972, 174 USPQ 158.	Aff.....	
8726	In re Brown.....	June 22, 1972, 174 USPQ 237.	Aff. in Pt.....	
8664	In re Herbert.....	June 29, 1972, 174 USPQ 259.	Aff.....	
8708	In re Michel.....	June 29, 1972, 174 USPQ 263.	Aff.....	
8713	In re Collins.....	July 13, 1972, 174 USPQ 333.	Aff.....	
8748	In re James et al.....	July 13, 1972, 174 USPQ 338.	Aff.....	
9009	In re Varga et al.....	Aug. 27, 1972, 174 USPQ 400.	Aff.....	
8622	In re Weistead.....	Aug. 3, 1972, 174 USPQ 449.	Aff.....	
8742	In re Forman.....	Aug. 10, 1972, 175 USPQ 12.	Aff.....	
8665	In re Pritchard et al.....	Aug. 17, 1972, 175 USPQ 17.	Aff. in Pt.....	
8672	In re Karpik et al.....	Aug. 17, 1972, 175 USPQ 23	Aff.....	
8674	In re Coker et al.....	Aug. 17, 1972, 175 USPQ 26.	Rev.....	
8686	In re Mulvey et al.....	Aug. 17, 1972 175 USPQ 29.	Aff.....	
8744	In re Miles.....	Aug. 17, 1972 175 USPQ 33.	Aff.....	
8755	In re Payne.....	Aug. 17, 1972 175 USPQ 39.	Aff.....	
8743	In re Murch.....	Aug. 24, 1972 175 USPQ 85.	Aff. in Pt.....	
8631	In re Sebek.....	Aug. 31, 1972 175 USPQ 93.	Rev.....	
8659	In re Yan.....	Aug. 31, 1972, 175 USPQ 96.	Aff.....	
8700	In re Swett.....	Sept. 7, 1972, 175 USPQ 102.	Rev.....	
8731	In re Langner et al.....	Sept 14, 1972, 175 USPQ 169.	Rev.....	
8763	In re Alul et al.....	Nov. 16, 1972, 175 USPQ 700.	Rev.....	
8800	In re Brown.....	Nov. 22, 1972, 175 USPQ 705.	Aff.....	
8581	In re Palmer.....	Dec. 16, 1971, 172 USPQ 126.	Aff.....	
8768	In re Mochel.....	Dec. 29, 1972, 176 USPQ 194.	Rev.....	
8790	In re Tashiro et al.....	Dec. 29, 1972, 176 USPQ 200.	Aff.....	
8793	In re Nelson.....	Dec. 29, 1972, 176 USPQ 202.	Aff.....	
8796	In re Mills et al.....	Dec. 29, 1972, 176 USPQ 196.	Aff.....	

TABLE I.B.—CIVIL ACTIONS IN THE U.S. DISTRICT COURT FOR THE DISTRICT OF COLUMBIA FOLLOWING DECISIONS BY THE BOARD OF APPEALS.

Civil account No.	Name of case	Decision date and citation	Disposition	Further review
2344-66	DeSeversky v. Brenner	Feb. 19, 1968	Aff	App. No. 22202 Aff. Feb. 13, 1970 [164 USPQ 495].
1193-65	Higley v. Brenner	Mar. 26, 1968	Rev. (on Rem. from Ct. of Apps. Nov. 7, 1967, [155 USPQ 481].)	
1131-66	Pennington v. Brenner	May 2, 1968, 157 USPQ 655.	Aff	
77-67	Nichols et al. v. Brenner	May 23, 1968	Aff	
95-66	Stohr et al. v. Brenner	June 3, 1968	Aff	App. No. 22257 Aff. June 16, 1969 [156 USPQ 609].
96-66	Stohr et al. v. Brenner	June 3, 1968	Aff	App. No. 22258 Aff. June 16, 1969 [156 USPQ 609].
1434-66	Research Eng. v. Brenner	June 5, 1968, 159 USPQ 31.	Aff	
2231-66	Puharich v. Brenner	June 20, 1968	Aff	App. No. 22286 Aff. June 25, 1969 [162 USPQ 136].
2316-63	California Research Corp. v. Ladd	Nov. 20, 1968	Rev. (on Remand from Ct. of App. Nov. 15, 1966 [151 USPQ 563].)	
3124-65	Scurlock et al. v. Brenner	Jan. 8, 1969, 160 USPQ 589.	Aff	
1358-66	International Salt Co. v. Brenner	Jan. 8, 1969	Aff. in Pt.	App. Nos. 22900 and 22902 Rev. Apr. 15, 1970 [165 USPQ 292] (P.O. position upheld).
1582-67	Johnsen et al. v. Brenner	Jan. 10, 1969 160 USPQ 519.	Aff	
1587-65	Smith et al. v. Brenner	Jan. 10, 1969	Aff	
1844-67	Aigner et al. v. Brenner	Mar. 31, 1969, 161 USPQ 617.	Aff	
706-67	Paterson v. Com'r of Patents	Apr. 8, 1969	Aff	
3404-66	Parker Labs. v. Brenner	Apr. 21, 1969	Aff	
3197-67	Horton v. Brenner	June 18, 1969	Aff	App. No. 23493 Aff. June 4, 1970.
1025-67	Pro-Col Corp. v. Com'r of Patents	Oct. 2, 1969	Aff	App. No. 23767 Aff. Nov. 25, 1970 [168 USPQ 17].
1132-67	Pollack et al. v. Brenner	Oct. 3, 1969	Aff	
1075-67	Fletcher v. Brenner	Oct. 8, 1969	Aff	
1203-67	Hoag v. Brenner	Oct. 7, 1969	Aff	
2599-67	Corning Glass Works v. Brenner	Mar. 11, 1970 169 USPQ 193.	Aff	App. No. 71-1424 Aff. in Pt. Oct. 16, 1972 [175 USPQ 516].
1488-70	Corning Glass Works v. Brenner	Mar. 11, 1970, 169 USPQ 193.	Aff	App. No. 71-1425 Aff. in Pt. Oct. 16, 1972 [175 USPQ 516].
128-68	Spotnails, Inc. et al. v. Brenner	May 12, 1970	Aff	
2867-67	Kessler v. Brenner	May 26, 1970	Aff	
1073-68	Cosden Oil & Chem. Co. v. Brenner	June 15, 1970	Aff	
2139-68	Fields et al. v. Schuyler	Apr. 17, 1971	Aff	App. No. 71-1525 Aff. Oct. 16, 1972 [175 USPQ 514] (Pet. Cert. Pending No. 72-1185) Denied May 14, 1973.
3240-67	Sanders v. Brenner	May 4, 1971	Aff	
2296-68	Charvat v. Brenner	June 8, 1971	Aff	App. No. 71-1731 (Pending)
1524-68	Harrison et al. v. Brenner	June 24, 1971	Aff	
2365-68	Zanft et al. v. Brenner	Sept. 9, 1971	Aff	App. No. 71-1907 Aff. Nov. 1, 1972.
135-69	Scholin v. Brenner	Sept. 9, 1971	Aff	
1282-68	The Plastic Contact Lens Co. v. Brenner	Nov. 17, 1971, 172 USPQ 97.	Aff	App. No. 72-1141 (Pending).
2414-68	Brown et al. v. Brenner	Dec. 16, 1971	Aff	App. No. 72-1252 (Pending).
3213-68	Birchard v. Brenner	Mar. 23, 1972	Aff	App. No. 72-1664 (Pending).
3048-67	Rexall Drug and Chemical Co. v. Brenner	Mar. 30, 1972	Aff	App. No. 72-1626 (Pending).
1013-69	Sze et al. v. Brenner	May 16, 1972, 175 USPQ 644.	Rev	
1537-69	Leesona Corp. v. Schuyler	Oct. 19, 1972	Aff	App. No. 73-1187 (Pending).

TABLE II.A.—APPEALS FROM THE BOARD OF INTERFERENCE EXAMINERS TO THE C.C.P.A.

Patent app. No.	Name of case	Decision date and citation	Disposition	Further review
7819	Baker et al. v. Codrington et al.	Feb. 1, 1968, 156 USPQ 398.	Aff.	
7862	Kravig et al. v. Henderson	May 16, 1968, 157 USPQ 564.	Rev.	
7919	Winter v. Lebourg et al.	May 16, 1968, 157 USPQ 574.	Aff.	
7930	Lebourg v. Winter et al.	May 16, 1968, 157 USPQ 574.	Aff.	
7879	Schmierer et al. v. Newton	June 27, 1968, 158 USPQ 203.	Aff.	
7896	Walter v. Ryan	June 27, 1968, 158 USPQ 216.	Aff.	
7979	Kahn v. Phipard	June 27, 1968, 158 USPQ 269.	Aff.	
7986	Fredkin v. Irasek	June 27, 1968, 158 USPQ 280.	Aff.	
7992	House et al. v. Miller	June 27, 1968, 158 USPQ 289.	Aff.	
7906	Fang v. Hankins et al.	July 18, 1968, 158 USPQ 345.	Aff.	
7803	Paivinen v. Sands	Sept. 5, 1968, 158 USPQ 602.	Rev.	
8005	Beeber et al. v. Krogh et al.	Nov. 21, 1968, 159 USPQ 594.	Rev.	
8056	Stevens v. Schmid et al.	Feb. 13, 1969, 160 USPQ 623.	Aff.	
8056	Derek v. Schmid et al.	Feb. 13, 1969, 160 USPQ 623.	Aff.	
8105	Gubelmann v. Gang	Apr. 3, 1969, 161 USPQ 216.	Aff.	
8038	Welter et al. v. Belicka et al.	Apr. 17, 1969, 161 USPQ 335.	Aff.	
8151	Storchheim v. Daugherty	May 22, 1969, 161 USPQ 679.	Aff.	
8156	Sletzing v. Lincoln et al.	May 29, 1969, 161 USPQ 725.	Aff.	
8108	Priesmeyer v. Rudy	June 5, 1969, 161 USPQ 776.	Aff.	
8141	Frillette et al. v. Kimberlin et al.	June 26, 1969, 162 USPQ 148.	Aff.	
8163	Barry v. Webb et al.	June 26, 1969, 162 USPQ 170.	Aff. in Pt.	
8169	Kistler v. Weber	June 26, 1969, 162 USPQ 214.	Aff.	
8155	DeGroff v. Roth et al.	July 24, 1969, 162 USPQ 361.	Rev.	
8182	Noyce v. Kilby	Nov. 6, 1969, 163 USPQ 550.	Aff. in Pt.	
8205	Kilby v. Noyce	Nov. 6, 1969, 163 USPQ 550.	Aff. in Pt.	
8206	Kilby v. Nelson	Dec. 4, 1969, 163 USPQ 684.	Aff. in Pt.	
8228	Munch v. Peterson	Jan. 29, 1970, 164 USPQ 343.	Rev.	
8209	Smith v. Stone	Feb. 12, 1970, 164 USPQ 453.	Aff.	
8262	Kademann v. Bollmann	Mar. 5, 1970, 164 USPQ 630.	Aff.	
8290	Weiss v. Roschke	May 14, 1970, 165 USPQ 579.	Aff.	
8322	Roschke v. Weiss	May 14, 1970, 165 USPQ 579.	Aff.	
8273	Piel v. Falkner	May 28, 1970, 165 USPQ 708.	Rev.	
8260	Bethell v. Theodore	July 2, 1970, 166 USPQ 199.	Aff.	
8116	Gordon et al. v. Freter et al.	July 9, 1970, 166 USPQ 322.	Aff.	
8117	Gordon et al. v. Freter et al.	July 9, 1970, 166 USPQ 322.	Aff.	
8275	Brokaw v. Vogel	Aug. 6, 1970, 166 USPQ 428.	Rev.	
8332	Norton v. Curtiss	Nov. 12, 1970, 165 USPQ 532.	Aff.	
8351	MacMillan v. Moffett	Nov. 12, 1970, 167 USPQ 550.	Aff.	
8348	Hemstreet v. Rohland	Dec. 3, 1970, 167 USPQ 761.	Rev.	

TABLE II.A.—APPEALS FROM THE BOARD OF INTERFERENCE EXAMINERS TO THE C.C.P.A.—Continued

Patent app. No.	Name of case	Decision date and citation	Disposition	Further review
8383	Reed et al. v. Tornquist et al.	Jan. 21, 1971, 168 USPQ 462	Aff.	
8439	Nicolaou v. Cooperman	Feb. 25, 1971, 168 USPQ 717	Aff.	
8463	Goodrich v. Harmsen et al.	May 6, 1971, 169 USPQ 553	Rev.	
8464	Lokey v. Harmsen et al.	May 6, 1971, 169 USPQ 553	Rev.	
8476	Anderson et al. v. Pieper et al.	May 27, 1971, 169 USPQ 788	Rev.	
8504	Byrne et al. v. Trifillis	June 3, 1971, 170 USPQ 32	Aff. in Pt.	
8608	Cortatowsky v. Mohammed H. Anwar	June 3, 1971, 170 USPQ 41	Aff.	
8472	Richardson et al. v. Cook et al.	June 10, 1971, 170 USPQ 86	Rev.	
8520	McAninch et al. v. O'Brien	June 24, 1971, 170 USPQ 224	Rev.	
8521	McAninch et al. v. O'Brien	June 24, 1971, 170 USPQ 224	Rev.	
8488	Watkins et al. v. Wakefield	July 1, 1971, 170 USPQ 274	Rev.	
8516	Fields et al. v. Conover et al.	July 1, 1971, 170 USPQ 276	Rev.	
8557	Smith et al. v. Horne et al.	Nov. 18, 1971, 171 USPQ 755	Aff.	
8542	Schwab et al. v. Pittman	Dec. 9, 1971, 172 USPQ 69	Aff.	
8573	Skinner et al. v. Pacak	Jan. 13, 1972, 172 USPQ 302	Aff.	
8559	Martin et al. v. Johnson	Jan. 27, 1972, 172 USPQ 391	Aff.	
8563	Myers et al. v. Feigelman et al.	Feb. 24, 1972, 172 USPQ 580	Rev. & Rem.	
8591	Rion et al. v. Ault et al.	Feb. 24, 1972, 172 USPQ 588	Rev. & Rem.	
8603	Tummers v. Kleimack et al.	Feb. 24, 1972, 172 USPQ 592	Aff.	
8626	Swengel v. Burkig et al.	Mar. 2, 1972, 172 USPQ 663	Aff.	
8595	Voisin et al. v. Coglianese et al.	Mar. 9, 1972, 173 USPQ 16	Aff.	
8655	Szekely v. Metcalf et al.	Mar. 16, 1972, 173 USPQ 116	Aff.	
8697	Sze v. Bloch	Apr. 27, 1972, 173 USPQ 438	Rev. & Rem.	
8593	Reinhart v. Coursen et al.	May 4, 1972, 173 USPQ 552	Rev.	
8734	Brinker et al. v. Kray et al.	June 1, 1972, 173 USPQ 803	Aff.	
8677	Gasch v. Mayo et al.	June 15, 1972, 174 USPQ 151	Rev.	
8647	Parker v. Frilette et al.	July 13, 1972, 174 USPQ 321	Aff.	
8688	Koval v. Bodenschatz	Aug. 3, 1972, 174 USPQ 451	Aff.	
8712	Williams et al. v. NASA	Aug. 10, 1972, 175 USPQ 5	Rev.	
8725	Wagoner et al. v. Barger et al.	Aug. 17, 1972, 175 USPQ 85	Aff.	
8653	Plumat v. Dunipace et al.	Sept. 14, 1972, 175 USPQ 105	Aff.	
8668	Snitzer v. Etzel et al.	Sept. 14, 1972, 175 USPQ 108	Rev. & Rem.	
8751	Langer et al. v. Kaufman et al.	Sept. 21, 1972, 175 USPQ 172	Aff.	

TABLE II.B.—CIVIL ACTION IN THE U.S. DISTRICT COURTS FOLLOWING DECISIONS BY THE BOARD OF INTERFERENCE EXAMINERS

Civil Action No.	Name of case	Decision date and citation	Disposition	Further review
6038 --- D.C.— E.D.— Ten- nes- see N.Div.	Eastman Kodak v. duPont de Nemours	Feb. 11, 1969, 161 USPQ 150.	Aff -----	
16434-4 D.C.— W.D.— M.O.— W.D.	Kirschke v. Lamar	June 6, 1969, 163 USPQ 99.	Aff -----	CA8. App. No. 19861, Aff May 25, 1970 [165 USPQ 679].
1654-67 D.C.— D.C.	Cody et al. v. Aktiebolaget Flymo et al.	June 19, 1969, 163 USPQ 607.	Rev -----	CADC App. No. 23575, Aff. Sept. 9, 1971 [171 USPQ 206] Pat. Off. Rev.
D.C.N.D. Calif.	Boyce et al. v. Anderson et al.	Unknown	Rev ----- Pat. Off. Aff.	CA9. App. No. 26308, Rev. Nov. 12, 1971 [171 USPQ 792].
147-72 D.C.— D.C.	Vogel et al. v. Jones et al.	July 20, 1972, 175 USPQ 152.	Aff -----	
70C 2329 D.C.— N.D.— Illinois E. Div.	Texas Instruments, Inc. v. Motorola, Inc.	Sept. 11, 1972, not reported.	Rev -----	
D.C.— S.D.— Indi- ana.	Rex Chainbelt, Inc. v. Borg-Warner Corp.	May 5, 1971, not reported.	Rev -----	CA 7. App. Nos. 71-1596 and 71-1597, Rev. Apr. 26, 1973 [177 USPQ 549] Pat. Off. Aff.

Senator HART. There's an appendix A, and I am not sure that I was able to figure out—I know I was not able to figure out how the average pendency rate can go down from the 36 months to the 23 months when the number of examiners decreased slightly, the number of applications pending increased by 4 percent, the number of applications received increased by 14 percent, and the number of patents granted decreased by 8 percent.

Now, if the average pendency goes back up—before getting to that, do I correctly interpret this appendix?

Mr. TEGTMEYER. I am not sure that all the factors that you referred to, Senator, are contained in the appendix A as we submitted it to you. There is information in there about pendency.

Senator HART. It is the arithmetic that bothers us.

Mr. TEGTMEYER. You mean—

Senator HART. If this is the full report it seems it does not square with a pendency reduction from 36 months to 23 months.

Mr. TEGTMEYER. Is your question—

Senator HART. My question is these numbers do not square, this 36 months down to 23 months. There may be other factors, and for the record you could supply them or come back and say that my figures are wrong and this does give you a reduction.

Mr. TEGTMEYER. I am not sure we understand fully what your question is. Is it how could we reduce the pendency time while not

increasing the number of examiners, or is it a mathematical problem?

Senator HART. In part. I think it is more a cold turkey arithmetic, and I would ask that our staff meet with whomever you designate to see if the arithmetic is off. If it is on, the record will stand here on 36 to 23. If it is off, then reflect in the record the elements that put it askew.

Mr. TEGTMEYER. The facts concerning reduction of the average pendency time from 36 months in 1966 to 23 months presently is correct. I do not know the exact mathematical problem here, but we would be glad to meet with your staff and correct it if there is an error.

Senator HART. Let's assume it is down to 23 months but for some reason or another it begins to climb up again. Would your opposition to deferred examination be modified under those conditions?

Is the reason that you oppose deferred examination largely because we are now down to what we will assume for this question to be 23 months?

Mr. TEGTMEYER. Our opposition to deferred examination is based both upon the fact that there is a lack of any foreseeable need in the near future, plus the fact that the deferred examination system, from the experience of the European countries, has not worked out as they planned.

The Common Market patent provisions do not provide for the full deferred examination system that was originally contemplated. The study of the systems that the Dutch and Germans have instituted revealed that they do not satisfy all the requirements that are part of the patent system.

A third reason I might note is the fact that we feel the publication of applications without examination, in a deferred examination system where they remain unexamined for some years, casts a cloud over the rights of others with respect to the invention involved. We pointed this out, I think, in our direct testimony.

Senator HART. Would it not be fair to say that if a primary objective was the assurance that patents when issued would be valid and good, if that is a primary objective, is it not true that deferred examination would contribute to that achievement? There are these other factors that we are talking about.

But if that were the one and sole objective, would not deferred examination clearly be in order?

Mr. TEGTMEYER. First, I do not see that deferred examination system would provide us with any substantial additional resources that we could devote to the examination of existing applications.

Second, I think that the examination process that is conducted in the Patent Office presently, especially, with the improvements that would be effected by the administration's bill, will provide a very strong, reliable patent.

We have no information that the present patent system has serious defects with respect to the validity of patents. We do recognize that there have been criticisms, and we are attempting through the administration bill, or will be attempting through the administra-

tion bill, to effect some improvements that will further strengthen the existing system.

Senator HART. We will not go over the figures as to how many patents issued have been found bad and trying to project how many of those not challenged might be bad. Maybe I have been oversold this idea, but it seems so obvious to me that if the same number of examiners work on fewer patent applications per year, that the quality of their decision would be improved, unless you assume that they are going to take longer lunch hours.

Would I look at this differently if I had patent experience?

Mr. TEGMEYER. Yes, sir, if I might comment upon your statement. We feel that the examiners in the present ex parte procedures spend an adequate amount of time examining applications to ensure the fact that the vast majority of the patents issued are valid; we feel the number of invalid patents issuing are very small.

If the examiner were to have additional time to spend upon examining applications, it would mean, for instance, that he would be searching subclasses and classes in the classification system that we maintain in the Patent Office that are rather remote from the subject matter involved in the application which he is examining.

Accordingly, the return from going to these more remote areas would be rather small as compared to the large amount of time required to go through this next level of searching.

So we feel that the situation would be such that it would require large amounts of additional time to be spent by examiners to effect a very small improvement in the validity of issuing patents. We have a situation where we must balance the limited benefits of additional improvements in validity against tremendous additional costs. We feel that the administration bill contains proposals, some of which have already been mentioned, that will make substantial improvements in validity at a much more reasonable cost. The bill strikes an appropriate balance between competing factors.

Senator HART. I do not frankly see where we are talking about added cost. We are talking about the same payroll and personnel working on fewer applications.

I do not know what the cost savings would have been, if any, had there been the deferred examination ethic in force over these years, during which period of time we were told that 70 percent of all the patents that are litigated are held to be bad.

You say it is 1 percent of all that we issue. If there had been deferred examination, I would believe that there would be a better track record on those litigated than being wrong 70 percent of the time.

Mr. TEGMEYER. If I may comment on your last statement, Senator. There are additional costs that are involved in the adoption of a deferred examination system in terms of printing, in terms of maintaining files in the Office for a longer period of time, and in terms of other processing that is required when requests for examination come from other parties. These additional costs would cut into the additional budget resources that might be available, because some percentage of these applications would never be examined.

Further, we are transferring the cost and workload of examination to the public, where it will be duplicated several times over, rather than having it performed only once in the Patent Office.

Senator HART. You are right. It would cost, just in terms of the literature I am sure, more and perhaps you could say substantially more, to have available to the examiner the sources that would give universal prior art. I am sure of that.

Witnesses yesterday claimed that there are no searches made of foreign patents, foreign literature by examiners now. Forgetting entirely whether the domestic searches are adequate, do you agree with that?

Mr. TEGTMEYER. We have a number of programs underway in recognition of the defects that exist in the Patent Office search file. We are taking steps through these programs to improve the search files. For example, we began subscribing to services that provide us with English language abstracts of the foreign patents we receive. We hope in the near future that this service will be expanded to all foreign patents. Further, we will soon be able to identify those foreign patents which are the first members of a family; that is, where applications on the same invention are filed in a number of countries. Thus, we will be able to eliminate from our search files duplicate copies of patents from foreign countries on the same inventions and to reduce the amount of material the examiner must sift through.

We do search foreign patents presently. We do classify them according to the classification system we have in the Patent Office. We have a translation section in the Patent Office that services the examiner when translation problems arise. In many cases, foreign patents can be adequately searched by reference to the drawings, particularly in mechanical areas.

We maintain very carefully our search file in that respect. I might note that we are presently in the process of inventorying the foreign search files for the purpose of insuring their integrity. We are planning to improve the integrity of the search files with respect to domestic patents, although their lack of integrity is small, and we are taking a number of other steps in terms of improve classification and so forth to bolster the search files utilized by the examiner.

We recognize the improvements that are required. We believe we are in the process of effecting those improvements, and they will occur in the near future.

Senator HART. On specific legislative proposals to provide mechanisms to make available worldwide information, in S. 1321 we propose five separate subsections in section 6. And if enacted into law, the Commissioner would be required to "maintain a complete and current library"; "establish liaison with all Government agencies"; "maintain with appropriate revisions a current publicly available classification and index by subject matter of scientific and other works and periodicals, both foreign and domestic"; "maintain public facilities in various parts of the United States for the searching of prior art and patent materials"; and "to the maximum extent feasible, mechanize, or otherwise facilitate the search of such prior art and patent material; and conduct an ongoing program of research

and development to keep the handling, classification, storage, and retrieval of such prior art and patent material current and up to the state of the art."

Does the administration bill contain provisions comparable to this?

Mr. TEGTMEYER. Yes, sir, it does, but not each and every one of the detailed provisions you have here. I might point out that existing law makes provision for many of these points of S. 1321.

Senator HART. How do you react to the disparity in the percentage of rejections between the U.S. Patent Office and Germany and Japan?

The reason I ask that, in your prepared testimony you suggested the effectiveness of the examination procedure, as demonstrated by the fact that the Patent Office refuses to grant patents on more than 30 percent of the applications which are filed.

Fortune Magazine says that in Germany and Japan 70 percent of patent applications are refused. If you cite 30 percent as proof of the effectiveness of our system, what would a German or Japanese do with that argument?

Does it follow that theirs is more effective?

Mr. TEGTMEYER. No; I do not believe it does. There are several factors involved, one of which is that all of the countries you mentioned have large backlogs of cases. It is only to be expected that the number of patents they issue, gradually falling further behind the date of filing, would only be a proportion of the applications presently filed.

I do not think that the statistics are reflective of the sampling of applications; that they reflect current filings versus current patents. If you are continually falling behind your work, naturally the number of patents issued would be lower. That would only explain a part of it, I realize.

Secondly, in many of the foreign countries they do not conduct the type of preliminary search—the applicant, that is—does not conduct the type of preliminary search that is normally conducted before filing in the United States.

Japan, for instance, has indicated to us that they receive a larger number of applications than we do of a frivolous nature; we do not get the same percentage of such applications in this country. The applications are filed with greater care in terms of presearching; and I think that explains a good deal of the differences between our examination systems in terms of quality of issued patents. I do not think there is any data that shows comparatively the relative validity of issued patents from one country to another.

We feel that we are high on the list and that we can support that. We do not think that we can say we are a little bit better than so and so or a little worse than so and so. We feel we are high on the list and can compare very favorably with any foreign countries which conduct a full examination.

Senator HART. You reacted as we thought you would to the question of an independent office. You make clear your recommendation having the office remaining in the Department of Commerce.

Am I to understand from the language used in the text of your prepared testimony that you favor the Commissioner of Patents reporting to the Assistant Secretary for Science and Technology, and would not support the Commissioner of Patents becoming Assistant Secretary?

Mr. BAKKE. Mr. Chairman, at the time that issue was last presented, in connection with S. 1254 in the 92d Congress, our position was that the Commissioner of Patents should not be elevated to Assistant Secretary level. The basis for that argument was, at the point in time when S. 1254 was being considered, that the President's comprehensive proposals for reorganization of the executive branch were before us. Accordingly, it seemed inappropriate at that time to make executive level changes in the Department of Commerce, including raising the Commissioner of Patents to the Assistant Secretary level.

Since that time, the same proposal has been reiterated in S. 1957 of this Congress. I can only say that the question is under consideration, reevaluation, in light of current circumstances. Clearly, there are many factors involved other than the question of executive branch reorganization.

And I must confess, Mr. Chairman, that at this time I am not prepared to say whether our position is different now or the same now but for different reasons.

Senator HART. Am I to understand that this is one section of your reform bill that has not yet been written?

Mr. BAKKE. Mr. Chairman, our reform bill does not address that.

Senator HART. It does not address it?

Mr. BAKKE. Right.

Senator HART. This is a very narrow question, but I think it is one that requires clarification, if for no other reason than to put rumors to rest one way or the other.

I am told that the trade press has suggested that Commissioner Gottschalk was fired pretty much on the spot, meaning without prior warning, by the Assistant Secretary of Science and Technology; and this was done for three reasons. That he refused to give special consideration to a particular patent application; that he was advocating many of the reforms, in modified form, that S. 1321 incorporates to the displeasure of the organized Patent Bar; and third, he was asserting the patent reform was so essential that the administration should not risk the fate of 1971 and should sever antitrust considerations from patent reform considerations.

There are two reasons for asking the question: first, to get a better reading on the need, if any, for establishing a Patent Office as an independent agency; but more importantly, simply to put on the record the question, and have you make full response to the charges.

Mr. BAKKE. Mr. Chairman, I have the highest professional and personal regard for former Commissioner Gottschalk. With respect to the circumstances to which you allude, I can only say that Commissioner Gottschalk was a Presidential appointee. He submitted his resignation to the President citing personal reasons; and I believe the matter must be allowed to rest there.

I think it would be inappropriate for me or for the Department of Commerce to comment beyond that on the resignation of a Presidential appointee.

Senator HART. Who can tell a Commissioner of Patents to pick up a particular file and make a decision with respect to that file, specifically a patent application?

Mr. BAKKE. In the final analysis that is a matter that rests solely within the discretion of the Commissioner himself.

Senator HART. He is responsible to no one? Surely that is not true.

Mr. BAKKE. Certainly, he is responsible to the President, and he is responsible to the Secretary of Commerce. He is responsible to the Congress with respect to the laws he administers and the charge and duties placed upon him by the statutory responsibilities.

Senator HART. It would be, putting it mildly, inappropriate for a Member of Congress to tell a Commissioner to take a file out of term and get a patent out. Would it be appropriate for the Secretary to tell him that?

Mr. BAKKE. I believe your question, Mr. Chairman, is much in the category of asking me to prove the negative. The fact of the matter is, I am unaware personally or from any knowledge on my part of any circumstances under which there has been any undue influence or attempt to exert improper direction or control over a Commissioner of Patents, either at this time or at any time in the past history of the Office.

I believe the fact that the Commissioner is a Presidential appointee, with all the dignity and integrity and character that the nature of such appointment connotes, should be viewed on its merits in terms of the separation, if you will, of the administrative discretion and responsibility of the Commissioner of Patents from any other agency or department with which he may be associated directly or indirectly.

Senator HART. I am not suggesting in this question that it would in every case or any case be inappropriate to, a sort of graceful way of saying ignore. I just ask you in order that I might have a better understanding of the relationship between the Office of the Commissioner of Patents and the Department of Commerce, whether a Secretary of Commerce appropriately could tell a Commissioner to act on a particular application out of turn.

Mr. BAKKE. Mr. Chairman, I believe that would be inappropriate.

I do believe, however, that there may conceivably be circumstances under which a Secretary of Commerce, given his broad responsibility, might feel compelled to suggest a class or category of applications be given expedited attention. I can conceive in that respect, for example, that applications relating to pollution control devices or technology could be in that category. Under those circumstances, I do not believe that would be at all inappropriate.

So I confine my response concerning inappropriate intervention explicitly to an instance where a single application is identified for unusual treatment.

Senator HART. Special treatment.

Mr. BAKKE. Yes, sir.

Senator HART. I agree with you on both points. Single special treatment cases are dead wrong; and an expression of what the Secretary thinks to be in the national interest in a subject area is quite proper.

Mr. Brennan.

Mr. BRENNAN. I will just ask one, but one very long and rambling question. Mr. Chairman. We will hear later in the session from the representative of the Patent Office Society, and I would like to compare your testimony with their prepared testimony.

On deferred examination the society supports deferred examination; the Department is opposed. On the Office of Public Counsel, the society supports the establishment of the Office: the Department is opposed. On adversary proceedings the Society rejects the reservations and objections advanced by the Department.

How do you account for this rather wide gap between the Department's position on these major issues and the judgment of the professional employees of the Patent Office?

Mr. BAKKE. If I might make a general prefatory statement, and then request Mr. Tegtmeyer to address it more precisely.

Mr. BRENNAN. As you wish.

Mr. BAKKE. Obviously in these issues, as in others, reasonable men can reasonably differ; and I do not feel that those who take a position contrary to one we feel to be the most appropriate, under all the facts and circumstances, are necessarily misguided, unenlightened, uninformed, or necessarily in every instance wrong. We just see it differently. A great many reasons may account for differences of perspective and differences of view.

With that prefatory statement perhaps Mr. Tegtmeyer can address himself to specifics.

Mr. TEGTMEYER. We are entirely separate, I might point out, from the Patent Office Society. They do not represent a Government view or a Department view. Certainly they have their opportunity and right to state their own position. I do not know what their reasons for taking these particular positions are; and of course, it would be more helpful in making any comment to have their reasons for it; nor do I know how the Society generates the views, or whether those views are those of the board or membership as a whole or so forth. So I do not think it is proper to comment upon their position.

We do not interfere in their activities in any way. They are entitled to state their own position.

Mr. BRENNAN. I appreciate the independence of the Society, but I think that the Department has to understand that we undoubtedly will give considerable weight to the views of the operating professional employees of the Patent Office, and we have this widespread split on these major issues.

Do you feel that there are perhaps factors available to the Department of a broader policy nature which are not known to the individual examiners as they formulate their positions in the Society?

Mr. TEGTMEYER. I might note that in discussions in the Patent Office concerning proposals of the reform or revision of the patent laws, we have taken into consideration the views of our management

officials that would be concerned with the various provisions. We have obtained full input from them. We feel that there may be information of a management nature that might not be available to the normal examiner. I might note that the Patent Office Society does have membership both in the management and the examining side of the Patent Office.

On the other hand, it is difficult to comment upon their reasons or speculate as to their reasons for the opinions or conclusions they have reached without knowing the rationale they used to reach these conclusions.

Mr. BRENNAN. Thank you, Commissioner.

Senator HART. Mr. Nash?

Mr. NASH. Let me turn back for a moment to a point raised by Senator Hart, Mr. Bakke, that relates to the quality of the patents issued by the U.S. Patent Office, and the dramatic decrease in the average pendency rate to 23 months.

We have had a reference yesterday, as I am sure you have been told, to a quota system, and it has been told to us that the quota system requires Patent Examiners to produce a certain amount of output upon pain of lack of promotion and other office type problems, and I think it is very important for this record to reflect the official view of the Patent Office as to, (a) whether a quota system exists, and (b) if it does, how it operates.

Mr. BAKKE. Again, Mr. Nash, may I ask Mr. Tegtmeyer to respond to that question?

Mr. NASH. Certainly.

Mr. TEGTMEYER. We do have in the Patent Office a goals program for the productivity of the individual examiners. This goals program, I should note, is separate and distinct from what we consider to be our overall office goals or objectives. And the goals that are set for individual examiners are not in any way dependent upon the goals we set for the office.

The goal that is given the individual examiner in terms of productivity is the result of a rather sophisticated program that has developed over the years. The goal was determined originally by looking at past experience factors in all the various arts, by looking at different grade levels, different expertise and experience levels within the Patent Office. The goal was set taking into consideration these factors and the relative difficulty of the art in which the individual examiner works.

Mr. NASH. Who sets that goal?

Mr. TEGTMEYER. The goal is set by management. It is also set, I might note, after consultation with the individual examiner so that the examiner can point out whether or not the goal set is fair and allows him to perform an adequate job with respect to quality. This is taken into consideration in determining both the difficulty factor assigned to the art in which he works, and to the weight given to past experience and productivity in that particular area.

Mr. NASH. Are the goals for each examiner or any examiner or any examining group been increased during the past 6 years when the pendency rate declined by one-third.

Mr. TEGTMEYER. The goals have remained substantially the same, although there have been adjustments, of course, in several respects. In part, the difficulty of the art is redetermined on occasions, and adjustments are made, both upwardly and downwardly in the goals. We treat our goals program as objectively as we can in a rather isolated way in terms of trying to look at it on its merits. In and of itself, we do not relate it to our overall office objectives except to the extent that when we set our overall office objectives, we must naturally take into consideration what we can expect from the resources we have. So there is a one-way look given to the examiners' productivity goals in setting up our overall office objectives in determining what resources may or may not be needed.

Mr. NASH. Are you saying in the past 6 years the goal of output for each examiner, or per examining grade has not been increased?

Mr. TEGTMEYER. Not on an overall basis. We did change to—I don't remember exactly when it was—we changed the formula by which we evaluate the examiner or determine the number of disposals the examiner produces. We bias it by giving some weight to first actions, because we recognize you cannot get a disposal unless you first pick a case up to examine it, and we try to create a balance from one year to the next in terms of disposals by working with a formula upon which the examiner's productivity is determined using both first actions and disposals.

Mr. NASH. If I understand you, then, you are saying that you are giving more weight to an examiner reaching his goal if he disposes of a particular matter the first time around instead of sending it back for additional information and looking at it a second time.

Is that right?

Mr. TEGTMEYER. No, sir, I did not say that. I merely said that the examiner's productivity in terms of disposals is determined by taking into consideration the first actions that he performs, whether or not the first actions are first action allowances.

Mr. NASH. If it is a first action rejection?

Mr. TEGTMEYER. It gets the same credit as if it were a first action allowance. It is just that disposals and first actions are both taken into consideration.

Mr. NASH. Is that a greater credit toward achieving his goal than if he has to look at a matter a second or third time?

Mr. TEGTMEYER. I don't understand the question.

Mr. NASH. Maybe you can supply for the record the set of rules and regulations or policies or whatever it is that defines the goals of the examiners and the examining groups. I think it would be helpful.

[The information referred to follows:]

U.S. DEPARTMENT OF COMMERCE,
PATENT OFFICE,
Washington, D.C. October 1, 1973.

Hon. PHILIP A. HART,
U.S. Senate,
Washington, D.C.

DEAR SENATOR HART: During the hearing before the Subcommittee on Patents, Trademarks and Copyrights of the Senate Judiciary Committee on September 12, 1973, the Department of Commerce was requested to supply for the

record an explanation of the goals that are set for patent examiners and patent examining groups with regard to the quantity of applications examined.

The Patent Office evaluates the performance of individual patent examiners according to both the quantity and the quality of their output, and the two are regarded as equally important. It should be kept in mind in considering the discussion of statistics and formulas below, that these are not the only criteria used to judge an examiner's performance.

The basic measure of an examiner's quantity of production is called a "disposal". One disposal credit is given to an examiner for each application which is allowed by him or abandoned by the applicant. When an examiner writes an answer to an appeal brief he is given credit for a disposal at that time rather than waiting for the subsequent allowance or abandonment. (Examiners' answers are not counted in determining the pendency time figure or the number of disposals at the Office-wide level.)

Another productivity measure often used is the term "hours per disposal". This item is calculated by taking the number of hours that an examiner devotes to examining in a given period and dividing it by the number of disposals with which he is credited during that period. Individual examiner production expectancies are set on an "hours per disposal" basis and not on a fixed numerical basis of so many disposals per year. Therefore, the number of disposals expected is related directly to the number of hours available for examining. Time spent on sick or annual leave, training, details to other positions, etc., is not counted as examining time. Attachment A shows the number of examining hours (column 5), the average number of applications disposed of per examiner (column 11), and the average number of hours per disposal (column 12) for recent fiscal years.

An individual examiner's production expectancy is calculated from a starting point of 18 hours per disposal for an examiner in grade GS-12. The 18 hours figure is the historical average production for a GS-12 as determined by a review of the average productivity of examiners in various GS grades over the period from April 1967 to March 1969.

The expectancy for an individual examiner may be higher or lower than 18 hours per disposal depending upon: (1) his GS grade and (2) art complexity factors. In the case of GS-13's, 14's and 15's, additional factors are taken into consideration. These are whether the examiner has been granted "partial signatory authority" or "full signatory authority", and whether he has attained official recognition as an "expert", "senior examiner", or "generalist". The expectancy for an individual examiner is not changed unless there is a change in one of the aforementioned factors, except in unusual cases (see Attachment B). This policy has been expressly communicated to all professional patent examining employees. Supervisors in the examining operations have been instructed to consult with their examiners on production expectancies, and an opportunity is provided for correction of erroneous assignments. (see Attachment B, page 1.)

The table on page 2 of Attachment B shows the factors used in calculating production expectancies for all GS grades. For example, a GS-5 is expected to produce 55 percent of the amount of a GS-12, and a GS-15 is expected to produce 140 to 150 percent of the amount of a GS-12.

The expectancy for a GS-12 examiner above and below 18 hours per disposal for the various groups depends on the complexity of the art examined, as shown in Attachment C. More complex arts require higher hours per disposal. The variations in the hours per disposal numbers in Attachment C reflect variations in art complexity between and within the examining groups. Expectancies range from 12.1 hours per disposal for the least complex arts to 30.0 hours for the most complex.

Examiner productivity is also measured in terms of "balanced disposals". This term, which takes into account both the number of first actions by the examiner and the number of disposals, is calculated by using the formula:

$$\text{Balanced Disposals} = \frac{\text{First Actions} + \text{Disposals}}{2}$$

The use of balanced disposals as a measure of productivity is intended to provide a fairer evaluation of output than measurement of disposals alone. A typical patent application requires at least two actions by the examiner, sev-

eral months apart, before it is in condition to be disposed of by allowing it a patent or by the applicant abandoning it. In other words, applications must be given first actions and "put into the pipeline" in order for disposals to be realized some months hence. A new examiner is unlikely to dispose of very many cases for the first few months of his tenure because he will be taking only first actions. On the other hand, an examiner taking over a docket previously worked on by another examiner may have an opportunity to take an unusually large number of second actions, many of which will result in immediate disposals, and therefore his disposal rate will be unrealistically high. Therefore, to give examiners credit for work they have done on first actions that have not yet been disposed of, balanced disposals represent an average of actual disposals and first actions.

We do not believe that the balanced disposal formula can be regarded as giving the examiner "double credit" for disposing of cases on the first action. To the contrary, by giving an examiner some credit for the work he has done on first actions, the balanced disposal formula avoids placing undue pressure on the examiner to dispose of new applications immediately by allowing them on the first action.

Any system for evaluating examiners according to the number of disposals may tend to influence some individuals toward lower quality work if their work is not also evaluated for quality. (As mentioned above, examiners are evaluated on quality as well as quantity). The balanced disposal formula does not create any added incentive to dispose of cases on the first action, however, since with a divisor of 2, a disposal on the first action gives only one balanced disposal, the same amount of credit that would be given for a first action disposal if actual disposals were the yardstick.

It should be noted that disposals and balanced disposals are not the only data available in the Patent Office to judge the examiner's performance. Information is also available for example, on the percentage of total disposals which are allowances, and on the percentage of appeals from examiners' actions which are affirmed by the Board of Appeals.

In addition to the expectancy goals that are established for individual examiners, the Patent Office establishes goals and estimates for disposals for the Office as a whole, and for each examining group. These goals and estimates are for the purposes of determining what appropriations requests will be made to the Congress by the Executive Branch, and for determining staffing needs after appropriations are obtained. The Office-wide and group goals and estimates do not affect the expectancies for individual examiners. (see Attachment B). In the event that the Congress decides not to appropriate all of the funds requested by the Patent Office for a given year, the Office's estimate for disposals during that year is revised downward accordingly.

I hope this information answers your question concerning Patent Office goals. We would be glad to provide any additional information that you desire.

Sincerely,

RENE D. TEGTMEYER,
Acting Commissioner of Patents.

Attachments.

ATTACHMENT A

TABLE

1	2	3	4	5	6	7	8	9	10	11	12	13
Fiscal year	Total average pendency (months)	Number of disposed of appeals	Appeals filed	Number of examining hours	Number of examiners	Number of regular examining hours	Number of overtime examining hours	Number of examiner man-years available thru overtime	Total effective examiner staff	Number of applications disposed of per effective examiner man-year	Hours per disposal	Percent turnover of examiners
1964 ¹	37	75,825	87,836									15
1965 ¹	36	102,165	89,234									18
1966 ¹	32	91,059	93,391									18
1967 ¹	32	96,811	88,508									17
1968	33	101,512	90,662	1,843,449	1,104	1,798,431	45,068	27.6	1,131.6	89.7	18.2	14
1969	31	102,070	96,821	1,859,023	1,132	1,853,914	5,109	3.1	1,135.1	89.9	18.2	14
1970	30	103,692	100,574	1,899,051	1,115	1,848,867	50,184	30.2	1,145.2	90.5	18.3	10
1971	28	109,245	104,160	1,932,071	1,166	1,932,071	0	0	1,166.0	93.7	17.7	6
1972	26	106,273	103,120	1,802,290	1,123	1,802,290	0	0	1,123.0	94.6	17.0	7
1973	24	113,047	101,000+	1,996,230	1,102	1,796,371	199,659	122.5	1,224.5	95.9	17.4	10

¹ For the years 1964-67, the supervisory primary examiner (SPE), time was not included in the number of examining hours as it has been since 1968. Moreover, the SPE's time is not available for those years. Accordingly, meaningful data for columns 5-12 for 1964-67 is not obtainable.

U.S. DEPARTMENT OF COMMERCE,
PATENT OFFICE,
Washington, D.C., October 11, 1972.

To: Patent examining directors, supervisors and examiners.
From: Office of deputy assistant commissioner for patents.
Subject: Individual examiner expectancies.

For purposes of uniformity and in order to avoid possible inequities it is deemed appropriate to clarify some aspects of the practice in the patent examining corps with respect to individual examiner production expectancies. The guidelines stated herein were established after consideration of the views of the Examining Group Directors, SPECO and POPA.

Production expectancies (hours per balanced disposal, hours per disposal, and hours per first action) for an individual examiner shall not be changed unless the change is based on the grant of signatory authority, other changes in degree of supervision (as indicated by grade changes through grade GS-13), the official recognition of an examiner as an expert, senior examiner, or generalist, or a change in the examiner's docket, examining technique, practice, or procedure. Exceptions may be made where there is clear justification, as for example error in docket complexity. Where an examiner requests a change based on an error in his expectancy assignment or where the Supervisory Primary Examiner finds such an occurrence, changes may be effected provided there is mutual agreement between the Supervisory Primary Examiner and the individual examiner involved. If no agreement can be reached, the final decision will be made by the Examining Group Director. All changes in expectancies of individual examiners, whether by exception or otherwise, shall be made after consultation between the Supervisory Primary Examiner and the involved examiner and be confirmed in writing.

Although expectancies will be changed upon the grant of a quality step increase in accordance with the standard set out in the Criteria for Incentive Awards (August 25, 1972), the receipt of an ordinary within grade or recognition for masters level will not be the basis for a change in any examiner's production expectancies.

It is apparent that variations in productive performance are logically a function of supervision and relaxation of supervision generally results in increases in examiner grade levels up to grade GS-13. It should also be recalled that the signatory program was originally established on the theory that the examiner's productive performance with these authorities would result in increased production. Further consideration must reasonably be given to the additional credit items wherein the Civil Service Commission Standard for the Patent Examining Series, GS-1224-0 states that these "positions are unique positions whose incumbents possess extraordinary personal qualifications, capacities . . ." Accordingly, using grade GS-12 as a base, productivity expectancies shall be calculated using the following factors:

GS-5 -----	.55	GS-14 (PSA) -----	1.25
GS-7 -----	.70	GS-14 (PSA + Sr or G) -----	1.30
GS-9 -----	.80	GS-14 (FSA) -----	1.35
GS-11 -----	.90	GS-14 (FSA + Sr or G) -----	1.40
GS-12 -----	1.00	GS-15 (FSA + Sr or G) -----	1.40
GS-13 -----	1.15	GS-15 (FSA + Expert) -----	1.50
GS-13 (PSA) -----	1.25		

These guidelines shall become effective at the beginning of the first pay period after January 1, 1973.

WILLIAM FELDMAN,
Deputy Assistant Commissioner.

ATTACHMENT C

RANGE OF HOURS PER DISPOSAL EXPECTANCY FOR GRADE GS-12 BY GROUP

Group	Low	High
110.....	17.2	17.2
120.....	14.7	14.7
140.....	17.4	18.5
160.....	22.3	26.7
170.....	21.5	23.0
210.....	15.4	24.0
220.....	16.9	22.3
230.....	21.0	30.0
240.....	12.1	26.5
250.....	16.2	18.9
310.....	14.3	16.4
320.....	15.5	18.9
330.....	13.0	28.4
340.....	14.6	19.3
350.....	16.3	20.6

U.S. DEPARTMENT OF COMMERCE,
PATENT OFFICE,
Washington, D.C., October 1, 1973.

Hon. PHILIP A. HART,
U.S. Senate,
Washington, D.C.

DEAR SENATOR HART: During the hearing on September 12, 1973, before the Subcommittee on Patents, Trademarks and Copyrights of the Senate Judiciary Committee, you asked the Department of Commerce witnesses how the pendency time for patent applications is calculated and how the reduction in pendency time over the last few years has been achieved. Your questions related to statistics the Patent Office provided in Appendix A of our letter to you dated August 31, 1973.

In reviewing Appendix A, we have discovered an error on page 9 in the number of patents issued for fiscal year 1968. We are enclosing a substitute copy of page 9 that we would like to have appear in the printed record. Even with this correction, however, the information in Appendix A alone does not provide an answer to your questions. Accordingly, we are submitting additional data in the table attached to the present letter which will explain the reduction in pendency.

Pendency of a patent application is defined as the time period occurring between the day an application is filed in the Patent Office and the day the same application is issued as a patent. The Patent Office calculates the average pendency time by averaging the pendencies of a representative sample of patents issued on a given date.

The Patent Office expects to be able to reduce the average pendency of a patent application to 18 months by the end of fiscal year 1976 in order to provide more timely patent protection for the inventor and earlier disclosure of patent technology to the public. As shown in column 2 of the attachment, average pendency decreased from 37 months at the end of fiscal year 1964 to 24 months at the end of fiscal year 1973.

Column 3 of the attached table shows the output of the patent examining operations over the period 1964 to 1973 measured in terms of "disposals". Total disposals represent the sum of applications allowed and applications abandoned each year. By comparing column 3 of the table with the number of applications filed, shown in column 4, it can be seen that the Patent Office has disposed of more applications than it received in every year since 1967.

Despite the fact that the number of examiners in the Patent Office has remained essentially unchanged since 1968 (see Appendix A and column 6 of the attached table), an important factor contributing to the recent reduction in pendency has been increased funding for the examining staff. This was particularly true during fiscal year 1973. Because of difficulties in recruiting additional examiners, the Patent Office during 1973 used funds equivalent to 122.5 examiner man years for paid overtime for the existing staff of over 1,100 examiners. Accordingly, when the overtime is taken into account, a significant

increase in the effective examining staff has occurred (see column 10 of attached table). Another factor contributing to the increased number of disposals has been a significantly lower rate of turnover in the examining staff since 1970. (See column 13.) The more experienced staff has been able to dispose of a greater workload.

In addition to the effective increase of the examining staff and the retention of more experienced examiners, a number of procedural changes instituted since about 1964 have contributed to the reduction in pendency. These changes have saved pendency time not by reducing the time devoted to examination but rather by shortening various delays inherent in the examining process. One major change was shortening of the period permitted for an applicant to respond to an office action from six months to three months in nearly all cases. Another change concerned the order in which pending applications were taken up for examination. Examiners were directed to give priority to applications with the oldest filing dates.

A further change required that the examiner's second action on an application be made the final action when this could be done without depriving the applicant of a fair opportunity to present his case. Still another change encouraged examiners to hold interviews with applicants or their attorneys, thereby eliminating some of the time required for back-and-forth written correspondence.

As a result of these revisions, a large inventory of amended applications on hand was reduced, thereby having an immediate effect in cutting the average pendency time. Moreover, these changes have resulted in shortening the time for prosecution following the first action. Interviews have frequently led to a better and earlier understanding of the issues involved in a particular application, and hence an earlier conclusion of prosecution.

Another change contributing to shorter pendency, made by the Congress, was amendment of section 151 of the Patent Code in 1965 to shorten the period for paying patent issue fees from 6 months to 3 months. (The Administration's patent bill that was forwarded to the Congress on September 27, 1973, would provide for further shortening of this time period.)

An administrative improvement within the Patent Office during the last year that has contributed to shorter pendency is elimination of a backlog in the Reference Order Section, a clerical support unit that supplies copies of patents cited by examiners to be mailed to the applicant. Formerly delays of 3 to 4 months existed in this operation, and currently delays have been reduced to a maximum of 1 month.

We hope the foregoing information provides a satisfactory answer to your question. Please do not hesitate to call upon us if you desire additional information.

Sincerely,

RENE D. TEGTMEYER,
Acting Commissioner of Patents.

Enclosures.

NUMBER OF PATENTS ISSUED BY GROUP

[Fiscal years, 1968-1972]

Group	1968	1969	1970	1971	1972
110.....	4,253	4,528	4,167	4,040	4,088
120.....	4,297	4,489	4,745	4,623	4,690
140.....	3,771	3,473	3,255	3,192	2,713
160.....	2,829	3,025	3,425	3,945	3,422
170.....	3,099	3,468	3,261	3,356	3,040
210.....	4,075	4,461	4,571	4,535	4,120
220.....	2,002	1,969	1,894	2,474	2,511
230.....	2,843	3,462	4,007	4,274	4,135
250.....	4,627	5,181	5,623	5,444	4,417
280.....	3,411	3,563	3,671	3,697	3,556
310.....	7,611	6,815	6,324	7,205	6,853
320.....	5,353	5,490	5,528	6,005	5,588
330.....	4,072	4,349	4,407	4,489	4,427
340.....	6,008	5,187	5,901	6,953	6,352
350.....	6,141	5,280	6,788	7,938	7,739
360.....	5,747	5,741	2,561	•	•
Corps.....	70,036	70,481	70,129	72,170	67,651

¹ Group 360 abolished in March 1970.

Mr. NASH. My particular question at the moment is whether or not if the examiner on his first action grants or rejects an application, does he get more weight for disposing of something the first time around in your formula than if he were to look at an application a second or third time after receiving the additional information from the applicant?

Mr. TEGTMEYER. You can make various analyses of the goals program. We do not feel there is any tendency in the goals programs, as it has been established, to lead examiners to issue patents on the first action any more than any other action, quite independently of the goals program. We have encouraged examiners to isolate the issues in patent applications as early as possible. We encourage them to cover all the matter on a first office action. We have a program by which examiners can, by telephone interview, contact the attorney to determine whether or not some amendments to the claims could be made which would make them allowable and which would permit a first action allowance. In the technical sense, it is really not a first action allowance if you look at the various steps that are taken before the allowance is made.

Mr. NASH. You mean via a telephone conversation an examiner can be satisfied to issue a patent application?

Mr. TEGTMEYER. The examination can only be satisfied by examining the application filed.

Mr. NASH. Let me rephrase the question I am trying to get an answer to. I know I have not studied the formula. I never knew it existed.

In that formula, with regard to the manner in which it is weighted, without the reason for it, just the fact, is it weighed in such a way that more credit is accorded the examiner if he disposes of an application, be it granting it or rejecting it, the first time around rather than after a second or a third office action?

Mr. TEGTMEYER. Every application receives both a first action and, at some point, a disposal. Therefore, an application issued on the first action receives no more credit than one that is issued on any other action. Accordingly, the formula cannot be definition—the definition you have given at least—give any more weight and credit to an examiner because he issues it on a first office action.

Mr. NASH. A first office action gets no more weight accorded than a second or third office action?

Is that right?

Mr. TEGTMEYER. In respect to any particular application, there is always a first office action. There is always a disposal. Therefore, an application that is issued on the first office action, as opposed to one issued on the second office action, gives the examiner no more credit than the one issued on the second action.

Mr. NASH. Where is the break point? Third action?

Mr. TEGTMEYER. There is no break point. In each case the examiner gets the same amount of credit over the whole period of examining any particular application, no matter on what action the allowance for disposal is achieved.

Mr. NASH. I am not sure if I fully understand what you have been telling me. I will certainly read the information supplied for the record. Maybe we may decide to seek further clarification.

My last point relates to the matters of deferred examination. I have read and heard the administration's views for opposing it. It seems to me—and I would like your reaction to this—that assuming that we do just as badly as the Dutch do, as you have explained it, and we only eliminate 35 percent of the applications that are filed, my arithmetic tells me that that will eliminate 40,000 applications from having to be reviewed by United States patent examiners.

Do you consider that insignificant?

Mr. TEGTMEYER. First of all, in our direct testimony, we point out another distinction between the Dutch experience and our own. That is the fact that 85 percent of the applications filed in the Netherlands are of foreign origin. The situation in the United States is quite different, and the tendency among applicants that come from foreign countries to a country with deferred examination would be to request examination in fewer cases than would the domestics of that country. Particularly that would be the situation in this country.

Mr. NASH. I appreciate that.

You may recall your response to Senator Hart's letter setting forth the United States' experience with foreign applications. My arithmetic indicates that in 1963, foreign applications accounted for about 17 percent of U.S. patents issued. In 1972 they accounted for 30 percent. By sheer numbers, foreign applicants have increased their number of U.S. patents granted over 300 percent since 1963, and the patents issued to U.S. applicants have gone up only 40 percent.

Now, I do not know whether that curve will continue or not.

If Europe is becoming as industrialized as we think, and Japan is as industrialized as we think, I think in a 10-year period we are going to have quite a different situation with regard to foreign patents.

If that were true, would that change your views on the need for the deferred examination system?

Mr. TEGTMEYER. There were other considerations referred to as far as deferred examination. That is the cost of printing, the cost of handling the applications, and the like. I would hope that we would never reach the situation where 85 percent of our patent applications come from abroad. It would be a rather sad tale if that were the case. We feel that a strong patent system will help insure the fact that that will not occur.

We agree with your statistics. I think it is reflective probably of the fact that since World War II there has been a resurgence in European countries. They are coming into their own. It is reflective of the fact also that international trade has increased, and there is naturally additional filings between countries, more so than there was in the past.

Mr. NASH. Thank you.

No further questions, Mr. Chairman.

Senator HART. Mr. Brennan?

Mr. BRENNAN. No further questions.

Senator HART. Gentlemen, thank you very much.

[The following letter was ordered printed at this point in the record].

GENERAL COUNSEL OF THE DEPARTMENT OF COMMERCE,
Washington, D.C., October 12, 1973.

Senator PHILIP A. HART,
U.S. Senate,
Washington, D.C.

DEAR SENATOR HART: I am writing in reply to your letter of September 12, 1973, requesting certain information for the record of your hearings on revision of the patent laws.

For fiscal year 1973, the Patent Office collected \$26,119,000 in fees. Expenditures for the same year amounted to \$64,536,000. The fee recovery rate, therefore, was approximately 40 percent.

The number of patent applications filed during fiscal year 1973 was 101,395. This number includes applications for plant and reissue patents, but does not include design patent applications. The total filing fees paid during the same period for these applications was 9,431,753. The average filing fee, therefore, was approximately \$93.

During fiscal year 1973, 69,328 patents were issued; including plant patents and reissue patents but not design patents. The total issue fees paid for these patents was 9,496,493, and the average fee paid was approximately \$137.

Our initial, rough estimates are that the Administration's patent revision bill will increase expenses about \$5 million annually, and that the average filing and issuance fee under the Administration's bill will total between \$450 and \$500. We would expect to divide this total in the same proportion as exists today between filing and issue fees. I would emphasize that our cost estimates must be considered as no more than a rough approximation, due to many unpredictable factors. For example, we have estimated that approximately 10 percent of issuing patents will be involved in opposition proceedings. This estimate may or may not be realistic, but only actual experience could provide a more precise figure.

I trust this letter provides the information you desire. I would be pleased to furnish further information or answer any questions you may have.

Sincerely,

(S) KARL E. BAKKE,
General Counsel.

Mr. BRENNAN. The Department of Justice.

Senator HART. Let me welcome a friend, a very prestigious professor of law at the University of Michigan.

Professor, if you will identify your associates.

Mr. KAUPER. For the record I will also identify myself, Senator. My name is Thomas E. Kauper, Assistant Attorney General of the Antitrust Division, United States Department of Justice.

I am accompanied on my left by Richard Sayler, special assistant to me; on my right Mr. Richard Stern, who is the chief of our Patent Section.

STATEMENT OF THOMAS E. KAUPER, ASSISTANT ATTORNEY GENERAL, ANTITRUST DIVISION, U.S. DEPARTMENT OF JUSTICE; ACCOMPANIED BY: RICHARD SAYLER, SPECIAL ASSISTANT, RICHARD STERN, CHIEF, PATENT SECTION

Mr. KAUPER. My prepared statement does not lend itself too well to summary.

I appreciate the opportunity to appear before you today to discuss the important subject of general reform and revision of the patent laws, title 35, United States Code. S. 1321, the Patent Reform Act of

1973 introduced by Senator Hart is another important effort at such general reform, a subject which has been under study in both Houses of Congress since 1967.

Since February of this year, an administration task force has devoted intensive study to this whole subject. The task force had the active support and participation of a number of knowledgeable personnel in the Departments of Commerce and Justice. It considered the whole range of issues and positions raised by the recommendations of the Presidential Commission on Patent Reform; S. 1042 of the 90th Congress—the proposed Patent Reform Act of 1967; S. 643 of the 92d Congress; S. 643, committee print—the result of this subcommittee's last round of hearings and markup of that bill; the Patent Law Modernization Bill—a November 1972, draft bill distributed by appropriate committees of the American Bar Association and the American Patent Law Association; and S. 1321—the reform bill presently pending before Congress. Of course, during the working sessions representatives of both departments made numerous suggestions of their own.

As a result of this exhaustive review of the existing law and previous reform efforts, the administration has drafted a reform bill that reflects the task force's consensus on the range of issues presented by a complete revision of title 35. The administration's bill will soon be submitted to the Congress.

In addition, the task force is presently reviewing the application of the antitrust laws to patent licensing practices, an issue previously the subject of hearings before this subcommittee. An administration position has not yet been reached on this subject, but one will be determined in the very near future. When that question is settled, whatever legislation is believed necessary, if any, will be forwarded to the Congress along with the patent law reform proposals we have already prepared.

Senator HART. Professor, at that point, because you stated it so clearly, I renew the suggestion that I made to the representatives of the Department of Commerce. If the administration has drafted a reform bill, as you advise us is the case, it would be helpful to have it.

Mr. KAUPER. Mr. Chairman, I was here during your statement to Mr. Bakke. I am fully aware of your views on this. We are endeavoring to get this bill to the committee as rapidly as possible within the confines of establishing the administration position.

Senator HART. You have got the administration position established and a reform bill drafted. Number 2, the administration position on antitrust is still in the cooker.

It would be helpful.

Mr. KAUPER. I appreciate that, Mr. Chairman.

The chairman of this subcommittee, in his August 6, 1973, letter to the Department of Justice indicated that these hearings were to include five subjects. I will discuss each of the subjects listed in that letter in turn. The positions that I will set forth are based on the task force's work and reflect the positions taken in the administration reform bill.

Number 1 is modification of patent examination proceedings to provide public adversary hearings. S. 1321 contains a number of provisions designed to provide public adversary hearings within the Patent Office. Section 122 provides that, prior to the first examination of an application for patent, the Commissioner shall index, make publicly available and publish the application. Under section 135(a), any person may then notify the Commissioner of any information which may have a bearing on the patentability of any claim of the application. Thereupon, such person may participate as a party, in an adverse role to that of the applicant, throughout the examination proceeding. Section 23 of S. 1321 affords the opposer, as a party, the right to discovery governed by the Federal Rules of Civil Procedure in any such proceeding. The Patent Office is given subpoena power to enforce discovery orders.

The administration is in full agreement that, before a patent issues, there should be an opportunity for interested members of the public to appear before the Patent Office in opposition to its issuance. The primary reason why such a proceeding is desirable is that it tends to assure that more relevant information concerning patentability will be considered by the Office prior to the time of issuance. Under the present system, a number of patents that the Office issues are later invalidated in court because the patentee's adversary in such subsequent litigation produces highly relevant information that was never considered by the Patent Office. It has been frequently asserted that in excess of 70 percent of the patents litigated in recent years have been held invalid. While this statistic can be misused, it is still alarming. A more recent study demonstrates that in more than three-fourths of these cases the Federal courts have relied largely on prior art or other information not cited to or considered by the Patent Office when rendering decisions as to invalidity. This strongly suggests that the primary goal of patent reform should be to get as much information concerning patentability from all sources—from the applicant himself, from the Office search files, and from members of the public—before the Office prior to issuance. The costs of failure to make such changes are immense, and should not be measured merely in terms of a high mortality rate for issued patents that are litigated in court.

As the Supreme Court has observed, patent litigation is particularly complex and expensive. As a result, many alleged infringers may of necessity prefer to take licenses under patents—even ones of dubious validity—than to pay the costs of litigating. The availability of an opposition proceeding prior to issuance, however, provides another meaningful and perhaps considerably more attractive alternative—presenting information concerning patentability to the Office. The Office would then be able to apply its expertise at the time when it can be most useful.

The opposition proceeding provided in the administration reform bill would take place after the Patent Office had fully reviewed the application, perhaps rejecting some of the original claims and narrowing others. At such time, a "notice of allowability" as to the application would issue to the applicant. Thereafter, the patent application and the Patent Office file concerning its prosecution

would be made publicly available, and the Office would publish this fact. From that time, a 3-month period will be provided during which any person who wishes to oppose issuance may request further examination of the published application on the basis of information he submits to the Office, without revealing his identity to the patent applicant. If the information submitted consists of patents, publications, or other documents or information in tangible form related to the state of the art, the Commissioner is then required to direct such further examination, by a primary examiner other than the one who originally examined the application.

If the opposing party so elects, however, he may identify himself and participate in a public opposition proceeding conducted by the Board of Examiners-in-Chief. The Board could refuse to conduct such a proceeding only if it found that the opposing party had offered no information which could form the basis for the Office to determine that a claim in the application is not allowable, a standard similar to that employed in ruling on summary judgment motions under the Federal Rules of Civil Procedure.

In an opposition proceeding before the Board of Examiners-in-Chief, the opposing party would be entitled to submit written briefs, present oral argument to the Board, take discovery in accordance with the Federal Rules of Civil Procedure, present oral testimony, and cross-examine witnesses. Two types of proceeding before the Board are contemplated—first, one involving the interpretation of only documentary evidence as to the state of the art, as would be disclosed, for example, in prior patents and magazine articles; second, all others, including proceedings involving fact questions as to conduct, prior public use or sale, prior inventorship, and the like. In the former type of proceeding, discovery, presentation of oral testimony, and cross-examination would all be somewhat more limited than in S. 1321, but these rights would be unconditionally available to opposing parties in the latter type of proceeding. Even in the former type of case, however, these rights would be available upon a showing of good cause to the Board.

The administration bill also provides that opposition proceedings before the Board of Examiners-in-Chief are open to the public. Finally, any party to such an opposition proceeding may take an appeal from the Board's decision pursuant to the provisions of the chapter of the administration's reform bill governing judicial review of Patent Office decisions.

The administration's proposal does not permit the public to participate in an adversary role throughout the examination process, as proposed in S. 1321. There are several reasons for this difference. The first is traditional. One of the rationales used to explain the patent system is the "contract theory"—the idea that the Government induces the inventor to disclose his inventive advance in science by promising him a limited monopoly in exchange for full disclosure thereof to the public. Since the first patent statute, however, disclosure to the public has occurred only after the Government has issued a patent. Obviously, all proposals for opposition proceedings prior to issuance require a change in this practice, if they are to work. The question is how much of a change is necessary in order to

secure from members of the public an adequate amount of information relevant to the question of whether any given patent should issue.

The administration bill seeks to strike a balance. Applications will continue to be examined by the Office, without public participation, primarily on the basis of information in the Office search files and information submitted by the applicant. Even under current examining procedures—and I will briefly describe some improvements in those procedures that the administration bill makes in a moment—Patent Office statistics show that this winnowing process results in rejection of some 30 percent of the applications filed and a substantial narrowing of the scope of the claims contained in many others. It seems that there is no need for public participation to challenge claims that will never be allowed or that will be substantially narrowed by the Office. Thus, the administration believes that the optimum time to permit public participation is after the Office has determined—first, that it will issue a patent, and second, what the scope of that patent should be based on all of the information then available to the Office.

A second reason for limiting somewhat the direct participation of the public in the examining process is the concern that in some cases such rights may be abused, particularly by one or more financially powerful and entrenched firms to forestall the issuance to a newcomer of a patent which threatens an established market structure or position. Any opposition proceeding can be misused in this way, and antitrust enforcement officials will have to be particularly vigilant to see that such abuse, insofar as it can be curbed by the rules articulated in such cases as *California Motor Transport* and *Otter Tail*, does not occur. But the simple fact is that the longer a competitor has to oppose the application—in S. 1321 virtually from the date it is filed—the greater his opportunity for unjust harassment. Again, it seems to us that the best course is to strike a balance, and that is what the administration proposal for opposition proceedings seeks to do.

Having said all of this, I must recognize that unlike S. 1321, the administration bill would continue the secrecy of most examination proceedings before the Office. The ex parte nature of patent examination creates greater opportunity for abuse by an unscrupulous applicant, and has provoked some critical comment by courts and commentators. However, in addition to the opposition proceeding proposed by the administration, our reform bill would make a number of further changes in Office procedures that will substantially reduce the possibility of abuse of the ex parte nature of examination proceedings. We propose, as does S. 1321, that there be a statutory duty of disclosure upon all persons appearing before the Office. This duty reflects existing law, and is more specific, and we believe more effective, than that articulated in S. 1321. The inventor would file an oath at or near the time of filing; the applicant, whether inventor or owner, would also have to file an appropriate statement, instead of an oath as provided in S. 1321, shortly after the notice of allowance of the patent. Unlike the statement by attorneys found in S. 1321, the administration bill would provide that

the submission of papers to the Office by the responsible patent attorney would be deemed to be an affirmative representation to the Office that there has been compliance with the statutory duty of disclosure. The administration bill would also require submission by the applicant of a patentability memorandum or brief, which would be used by the Office during the examination process. Unlike S. 1321, however, the Commissioner would be given the option, after an appropriate report to Congress in five years, of determining whether or not to continue to require such a brief, or to modify the applicability of the requirements of the bill.

Also, the administration bill would organize examination proceedings more like regular adjudicatory proceedings and provide for the making of a full record of Office actions. The examiner would be specifically empowered to control the examination proceeding. The Administration Bill would further require that assertions of fact be reduced to writing, and that they be supported by empirical data, unless the applicant submits an appropriate showing that there is a reasonable basis on which to draw the conclusion stated. Moreover, if he considers it desirable the examiner would be empowered to request of the applicant further support of any assertions of fact or contentions of law. Many of these provisions are not found in S. 1321.

Although I will discuss this subject in more detail when I move on to the Office of the Public Counsel proposed in S. 1321 it is appropriate to note here that under the administration bill the primary examiner would also be able to request the assistance of an officer within the Office, who then would be able to participate as an adversary to the applicant in the examination proceeding.

Moreover, the administration bill provides that all decisions by the Office shall be in writing and follow the requirements of the Administrative Procedure Act that reasons be given that furnish an adequate basis for Office actions. And, whenever the patentability of a claim is to be decided by the Patent Office, the bill expressly states that the applicant has to meet the Administrative Procedure Act's rule that the proponent of an order has the burden of establishing that the claim is allowable. All final or nonfinal decisions by the Office involving the interpretation of title 35 or regulations promulgated thereunder would hereafter be made public, subject to appropriate safeguards.

We believe that the sum of these procedural changes will be to make Patent Office proceedings more like those of the familiar administrative agencies, to permit the Office to secure from applicants all information within their control which is needed to pass on patentability, and to assure preparation of a complete record of the proceeding. The latter consideration is especially important, since this improved record of Office proceedings will be available both to potential opposers after notice of allowability and to litigants in subsequent court cases concerning issued patents.

I now turn, Mr. Chairman, to the creation of the Office of Public Counsel. S. 1321 would create an Assistant Commissioner of the Patent Office, designated the Public Counsel, and section 3(d) gives this new official a number of responsibilities. He has the full rights

of any third party before the Office. He may intervene in any Office proceeding, or take an appeal therefrom. He is to defend or prosecute appeals from any final action of the Patent Office. He may conduct such investigations as are appropriate to carry out the purposes of title 35. He is specifically made independent of the Commissioner of Patents in the performance of these duties, and may not be removed from office by the Commissioner.

The administration bill does not provide for an independent Public Counsel with responsibilities of this scope. One of the concerns of the administration and the task force has been that the very breadth of the responsibilities conferred upon the Public Counsel by S. 1321 would be likely to impede the effective performance of any one of those functions, particularly when the workload of the Patent Office is presently running at about 115,000 applications filed each year.

Thus, the administration bill would require the Commissioner to appoint an officer in such organizational structure as he and the Department of Commerce decide. The administration bill also attempts more specifically to define the officer's role, in the belief that such definition will maximize his effectiveness and usefulness. This officer would be empowered (but not obligated) to participate as an adversary in an examination or other proceeding upon the request of a primary examiner, or the Board of Examiners-in-Chief, would be obliged to defend (but could not initiate) appeals to the Board of Examiners-in-Chief and the courts, and would conduct investigations pursuant to authority similar to that proposed in section 24 of S. 1321. Unlike S. 1321, however, this officer would not have independent authority to intervene in examination proceedings, nor would he be able to appeal to the allowance of claims by the Office. He would not be appointed by the President, by and with the advice and consent of the Senate, as provided in S. 1321. However, the Department of Commerce could, and presumably would, make the officer's post one in career civil service.

We believe that two aspects of the officer's role as defined by the administration bill are especially significant. First is the officer's responsibility to defend the rejection of claims by an examiner when the applicant appeals such rejection to the Board of Examiners-in-Chief. This is an improvement over existing practice, under which the examiners must defend their decisions before the Board—a practice which has generated criticism to the effect that it will bias examiners against rejection and in favor of allowance. Such practice also makes a patent examiner both a judge and, subsequently, an adversary litigant. Second is the provision that a request from a primary examiner serves as the trigger for the officer's participation in the examination proceeding. This should serve to make certain that significant proceedings involving important legal and factual issues occupy the officer's time, since the Office personnel closest to the application process—the examiners—will be free to request assistance from the officer through their primary examiners. Such assistance would, of course, include discovery if necessary.

Now let me turn to deferred examination. Chapter 18 of S. 1321 would create a system of deferred examination of patents. Unless an

applicant requested immediate examination of his application, it would be examined for formal matters and then published. For up to 5 years thereafter, examination would be automatically deferred unless the applicant or any member of the public upon payment of the basic examination fee requested examination. If 5 years pass without any such request for examination, the application would be regarded as abandoned. Presumably as a further inducement to applicants to defer, section 153(b) of S. 1321 provides that the term of a patent shall be extended by the amount of time examination was deferred.

The basic argument in favor of deferred examination is that the expense and burden of an examination proceeding, both on the applicant and the Patent Office, could be deferred, and perhaps avoided altogether, for alleged inventions whose commercial viability is not apparent at the time of filing. If the claimed subject matter later proves significant, examination can be had on the basis of the applicant's original filing date; if no significance appears, the applicant can let the application go abandoned after 5 years. In short, the applicant can wait to see whether examination is "worth the candle." In cases where he decides it is not, he may avoid the expense and the Office will never have to devote its examiners' time and effort. Theoretically, this permits the Office to devote more time to the examination of those applications of some commercial significance.

There are, however, costs to such a system, and the administration has decided—after careful study—not to include such a system in its reform bill. The Department of Commerce has already stated that, in its view, such a system would not in fact result in a significant savings of examination time. I cannot shed further light on their assessment of Office statistics, to which I defer here. I would, however, like to express the administration's concern about a system of deferred examination from the standpoint of competition policy.

Under S. 1321, and all other proposals we have seen for deferred examination, applications whose examination is deferred would be published. But current Patent Office experience indicates that only about 70 percent of all applications filed will ultimately issue as patents. Moreover, even those applications which do mature into patents are often amended, during the examination process, to narrow substantially the scope of the monopoly coverage. As a result of publication of deferred applications, however, competitors and potential entrants into a market would face in such applications a number of claims to monopoly power that, upon Office examination, could prove either totally unjustified, or overly broad. These businessmen would not know which claims were legitimate and which were spurious. There is the added danger, too, that applicants, realizing this, would have an incentive to draft claims far broader than those they could reasonably expect to issue from the Office after full examination.

We recognize that section 192 of S. 1321 would permit members of the public—particularly competitors of the applicant—to start the examination process, if they are willing to pay the basic examination fee. It is true that this permits competitors or potential new

entrants to trigger machinery that might eliminate or narrow these unjustified monopoly claims. However, given the delay inherent in any examination proceeding, we do not believe that this safeguard is adequate to obviate the "chilling effect" these deferred applications would have on legitimate research, potential investments, or other desirable competitive activity.

Now, I will deal with the question of maintenance fees. S. 1321 permits the Commissioner to prescribe regulations setting fees to be charged for the examination of patent applications, and other services of the Office. Section 41(b) requires those fees to effect an overall recovery in the range of 65 to 75 percent of the costs of operation of the Office, with a maximum charge for simple patents of \$100. Section 41(b) also permits fee exemptions in order to benefit and encourage individual inventors and small businessmen.

More significantly, however, S. 1321 provides for a system of annual, accelerated maintenance fees, starting at \$1,000 per year beginning the fourth year after a patent issues. Section 41(c)(2) provides that these maintenance fees may be deferred if the patentee establishes either that he has made a good faith effort commercially to work the subject matter patented but was unsuccessful due to circumstances beyond his control, or that he is otherwise unable to pay any such maintenance fee.

The administration agrees with the concept of giving the Commissioner discretion to set his fees so that the Patent Office recovers 65 to 75 percent of the costs of its operation. The Administration Reform Bill would, however, give the Commissioner more discretion to determine the appropriate rate schedule. He would be able to set the initial filing fee low enough as not to discourage applicants from coming to the Office, as long as the final examination and publishing fee he charged for issuing a patent would cover the desired range of cost recovery. Unlike S. 1321, there would be no set maximum fee, nor would the Commissioner be able to prescribe fee exemptions.

The administration bill also proposes a system of maintenance fee payments after a patent issues. Our bill is similar in principle to S. 1321 on this score, but different in form and timing. Our proposal is to require that the patentee, during the life of his patent, file two statements with the Office indicating whether or not he or any person in privity with him is commercializing the subject matter of any claim or claims of his patent, or whether good faith efforts are being directed toward such commercialization. The required statement also must explain and describe the acts and steps which have actually been undertaken in respect of such actual or attempted commercialization. The first of these statements must be filed 10 years after the beginning of the patent term, and the second 15 years from the beginning of the term.

If the subject matter is not being so commercialized by the patentee or a licensee, however, the administration bill provides that the patent shall lapse unless the patentee pays a fee of at least \$1,000 and \$2,500, respectively, at the 10th and 15th years. The fee is not due every year, as in S. 1321. But unless the patented subject matter was being commercialized in the manner provided by the statute, the patent would lapse if the patentee did not pay the fee, which could not be waived or deferred.

We believe that this proposal will encourage patentees to examine carefully the question of whether patents which they have secured are serving any economic purpose, and to do so at least two occasions during the 20-year patent term. If in fact patents are not being used by their owners or by licensees thereof, substantial fees such as those proposed in the administration bill should encourage early dedication of the subject matter to the public. Thus, such patents would be removed from the economy as potential clogs on commerce. This result can only be viewed as procompetitive. Again, while there are similarities here to the proposals contained in S. 1321, an annual fee might impose substantial administrative and financial burdens on both the Patent Office and patentees. In addition, there is some danger that fees that are imposed too early in the patent term would have the effect of penalizing the patentee—who may be an individual or a small business without extensive financial resources—that has disclosed a truly significant inventive advance, an invention far enough ahead of its time that real commercialization takes a number of years to achieve. Even a chance to defer maintenance fees is not a completely adequate solution, for the preparation and the processing of such requests impose additional burdens on both patentees and the Patent Office. Accordingly, the Administration's proposal as to such fees again seeks a means of minimizing burdens and risks attending such fees while furthering the desirable goal of clearing the books of unused patents prior to the time their full terms would run.

Lastly, let me address the question of establishing the Patent Office as an independent agency. S. 1321, in section 2, would make the Patent Office an independent agency rather than continuing it as part of the Department of Commerce.

The administration opposes such a change in administrative structure, primarily on the basis of the arguments advanced earlier by the Department of Commerce. I would add to that, however, an observation. The administration reform bill contains some language designed to insure that Office decisions will continue to be made, as they have always been made in the past, solely on the basis of a reasoned application of law to particular facts. Thus, the administration bill provides that the Patent Office is subject to the Administrative Procedure Act, 5 U.S.C. sections 551-559, 701-706, and contains statutory language that would provide that the Office "shall function independently of the Department of Commerce in the exercise of discretion concerning its adjudicatory functions."

Thank you very much, Mr. Chairman, for the opportunity to express our views on these five subjects, as I am sure you are aware, most issues connected with patent reform cannot be considered in a vacuum. As my testimony today indicates, almost every issue relates to one or more other questions and one must always keep in focus the totality of the reform proposal being advanced. Let me conclude by stating that the remainder of our views on S. 1321 will be apparent when the administration reform bill is submitted to the Congress. I hope this discussion of some comparisons between that bill and S. 1321 has been helpful to this subcommittee.

Senator HART. Thank you, Professor.

As I followed your testimony, I realized how correct you were when you said it was a statement that was not susceptible to summary. It was an effectively prepared presentation.

The elements of the administration bill that you describe in response to the five subject areas that we specifically asked about all seem to be in the direction of solid reform. We disagree, as you indicated, on particulars, but the direction is the same.

What about some of the things that apparently are omitted—at least you have omitted them in the presentation? I am going to enumerate six areas and inquire whether these proposals were considered and rejected or whether they were simply not considered. It may be necessary that you respond for the record later. Perhaps you can respond to some or all now.

Did the administration consider changing the standard of invention fixed in section 103?

Mr. KAUPER. I think, Mr. Chairman, it would be fair to say that consideration has been given to making a change to that, and no changes have been made.

Senator HART. The second, changing the standard of novelty in section 102.

Mr. KAUPER. My understanding, Mr. Chairman—and I think as with virtually all of the provisions of almost all these proposed bills mentioned at the outset of my statement—full consideration was given to changing these provisions as well. Basically, we are retaining the existing provisions.

Senator HART. That answer would apply, then, to changing the standard of utility under section 101, as proposed by the APILA?

Mr. KAUPER. I think the administration bill—and I must say, sometimes I am a little confused on some of these—but we have decided against any proposals to significantly change the law on utility. There have been a number of proposals made dealing with such things as utility in research, that sort of thing. They are not part of it.

Senator HART. The fourth, changing the presumption of validity. That is section 282 in the proposal.

Mr. KAUPER. The present law on that, we believe, is effective, and we have considered a number of proposals with respect to that provision. No changes have been made, Mr. Chairman.

Senator HART. Fifth, the creation of a specialized patent court, apart from the normal judicial system and the inter-relationship of the Administrative Proceedings Act.

Mr. KAUPER. I think, Mr. Chairman, there is no such provision. I think, in respect to a specialized court, that this is an idea that I am sure you are aware is involved in other matters with which we have some involvement. My general feeling has always been that I prefer generalists on matters such as this. There is no such provision for a specialized patent court in the administration bill.

Senator HART. I instinctively have this feeling that generalists are better, until I found myself chairing a patent hearing. Then, I am not so sure.

Mr. KAUPER. Being on this side, it does shake my confidence in that statement a little. I think I would have to agree, Mr. Chairman.

Senator HART. Sixth, did you intend to change existing law by adopting a proposal for assignee filing?

Mr. KAUPER. A wide variety of assignee filing provisions was considered. Basically speaking, the administration bill does permit an assignee to file papers, subject to the protections for the individual inventor. It does not, however, change the existing substantive law with respect to joint inventorship or identifying inventive contributions by different individuals.

Senator HART. There is no need to review with you the up-and-downhill business of the antitrust treatment and the subcommittee and committee's action last year and the year before last.

Let us find out, to the extent that you are free here, your own feeling, the Department's feeling, the administration's feeling, on this matter. Professor Turner and Judge McClaren, your predecessors, opposed the inclusion of antitrust licensing provisions in the patent reform legislation. Then Commissioner of Patents, Commissioner Brenner, opposed the inclusion of such a provisions in 1967 and 1968.

Since then, I believe, the Patent Office has changed its position. I would like to know the present views of the Anti-Trust Division on the need for such antitrust provisions.

Mr. KAUPER. Mr. Chairman, I do not believe it would be appropriate at this time for me to answer that. An administration position is being developed with respect to that issue and will be resolved, I hope, very shortly. At that point, I would be perfectly happy to discuss that decision and its merits or lack of merits. I think it important that we proceed with formulating the administration position.

We have a request, as I recall, from the chairman of this subcommittee for an administration position on this issue. And in an attempt to comply with that, I think we had better keep on the tract that we are presently on.

While I would be more than happy to discuss this with you in any forum you may like once the decision is made, I think I should wait until that time.

Senator HART. This may, at least, signal the delay that would be involved if there are antitrust provisions. I think we would have to take you up on your offer to come in and talk about it.

Mr. KAUPER. I would assume so, Mr. Chairman.

Senator HART. I should indicate that a vote has been scheduled in the Senate to begin about noon, but I would anticipate that we will be able to conclude before a recess.

This is not the most important thing in all the testimony given us, but why do you say that the administration bill is going to have the patentability brief requirement expire after 5 years?

Mr. KAUPER. I think there has been a feeling that this is simply a way to re-evaluate its effectiveness and whether there are other means of securing the same information.

There seems to be some confusion in the actual meaning of the statement, as to whether it actually expires within 5 years. The Commissioner is given some options after 5 years. What it is designed to do, without going into details of it, because there might

be some disagreement about the precise meaning of that, is to permit a re-evaluation of the requirement at a particular point in time and permit, to a certain degree, some redesignation by regulation—perhaps even as to classes of cases where the brief would be required. The requirement is mandatory at the outset of the bill. But the provision I have been discussing would create some flexibility for the Commissioner, as well.

Senator HART. I asked this in part because twice the Patent Office tried to require this patentability brief by rulemaking, and it was included in the bill of 1971.

I am not sure that either of us will have a better understanding at the end of these next several questions as to where we should be on how many years, but let me try anyway.

You recommended a 20-year patent term. That is 3 years—

Mr. KAUPER. From the date of filing.

Senator HART [continuing]. From the date of filing, a 3-year increase over the present.

Mr. KAUPER. Well, the extent to which it is an increase, of course, depends on when you begin the term.

Senator HART. Your bill and ours start the term from the date of filing rather than the date of issuance?

Mr. KAUPER. That is right.

Senator HART. The Patent Office expects to get to its goal of an 18-month pendency period. Assuming that happens, we would calculate the new patent term at 18½ years.

Mr. KAUPER. I understand your arithmetic. A 20-year term, of course, is the term that was in the committee print earlier.

Senator HART. What I am really leading up to, without arguing 18 months, good or bad—does the Department have or know of any economic study that suggests 20 years?

Mr. KAUPER. I think the answer to that is no.

Senator HART. On the business of the potential anticompetitive effect in this business of deferred examination, it is your judgment that it could or would be anticompetitive because competitors would not know which claims might be allowed and hence would be disadvantaged.

Let's assume that to be correct—could you not argue that that would be better than the issuance of a large number of low quality patents?

Mr. KAUPER. Yes; I think that is true, Senator. I think if one assumes that there is going to be a large number of low quality patents issued, then, weighing all various competitive factors, obviously that becomes fairly important.

I think, however, discussing deferred examination, that there are a variety of choices that are present here. One way is to proceed along the deferred examination route. Another is to say, the best way to improve the quality of issued patents is to get the most effective examination as rapidly as possible from the outset. This provides more certainty. It may assure quality from the outset.

And I think what we are saying is that we believe, in essence, that that is the preferable course, rather than starting down the path of a deferred examination system.

Now, obviously, one's views depend on how successful one thinks the process will be.

Senator HART. Thank you very much.

Mr. KAUFER. Thank you, sir.

Senator HART. There being a vote occurring now, I would suggest a recess until 2 o'clock.

[Whereupon, at 12 p.m., the subcommittee was recessed to reconvene at 2 p.m., the same day.]

AFTERNOON SESSION

Senator HART. The subcommittee will be in order.

Mr. BRENNAN. Mr. Chairman, the first witness this afternoon is Mr. Dunne of the Patent Office Society.

STATEMENT OF MR. JERRY DUNNE, CHAIRMAN, LEGISLATION COMMITTEE, PATENT OFFICE SOCIETY

Mr. DUNNE. Mr. Chairman, members of the committee, my name is Jerry Dunne. I am the chairman of the Legislative Committee of the Patent Office Society.

I wish to state for the record that I am appearing here today on annual leave, and that I am an employee of the Patent Office.

The Patent Office Society is an organization devoted to the furtherance of the patent and trademark systems and the professional development of its members. The society numbers among its members over 1,100 Examiners and other professionals of the Patent Office. This represents over 90 percent of the total number of professional employees in the Patent Office. Although many of its members are employees of the Patent Office, the society conducts its affairs independently of the Patent Office, thus this report does not reflect and should not be construed to be the views of the Patent Office administration.

ESTABLISHMENT OF THE PATENT OFFICE AS AN INDEPENDENT AGENCY

Section 2 of S. 1321 provides for the establishment of the Patent Office as an independent agency. The Patent Office Society favors in principle such an administrative restructuring.

The Patent Office, in fulfilling its duties in administering the patent system, affects three separate sectors of the national community. The decisions and policies of the Office affect the business community, the scientific community, and the consuming public. Presently, decisions of policy effecting the patent system are influenced by the Secretary of Commerce, who is charged with furthering American business interests, the Assistant Secretary for Science and Technology, charged with furthering the interests of the scientific community, and the Patent Office administrative personnel. The divergent and possibly competing interests of these various sectors provides for at best, a decisionmaking process responsive to the interests of the various sectors and at a minimum, competing policy

interests that frustrate attempts at positive and effective management.

S. 1321 provides an administrative restructuring that would retain the positive aspects while diminishing the negative influences in the present administrative feedback between the Commerce Department and the Patent Office. Section 10 of the proposed bill, providing for the Advisory Council on the Patent System, insures the necessary input to the decisionmaking process from those sectors of the citizenry affected by the policy decisions of the Patent Office. Section 2 of S. 1321, establishing the Patent Office as an independent agency, frees the Office from the possibility of its programs and policy decisions being affected by interests and influences not in the best interests of the general public nor the patent system.

I would like to move on to the creation of the Office of Public Counsel. Section 3(d) of S. 1321, creates the Office of Public Counsel. The Patent Office Society favors in principal the creation of such a position within the Office.

The creation of the Office of Public Counsel will place additional burdens upon some patent applicants of time and expense. Whenever the Public Counsel intervenes in any proceeding, the applicant will incur additional legal expenses and possibly a delay in issuance of his patent. However, by the very nature of the Public Counsel's mission, that is, to intervene in the public interest, the Public Counsel will participate in patent applications they will have a propensity to be of significant economic influence and thus of great value to the applicant. Under such conditions, the additional expense that may attach to the applicant will not defer him from filing nor unduly prejudice his right to the patent monopoly, which offers him such potential benefits. When the Public Counsel intervenes in the proceedings before the Office on applications of substantial economic interest to the nation, the additional expense to the applicant and the government is justified to insure such patent applications receive the best possible consideration in the Office, to protect not only the interests of the public, but also the rights of the applicant.

The specific statutory language of section 3(d) of S. 1321 is objected to, as can be noted in appendix A. It is the position of the society that certain safeguards, to insure proper qualifications of the public counsel and adequate staff, be provided. Further the language requiring review of all Office proceedings places an undue burden on the public counsel. To monitor all proceedings would require a staff approaching in size that of the examining corps. It is urged that such a large allocation of manpower would better be used elsewhere within the Office with more dramatic results in improving the patent system. Further it is suggested that the specific delineations of when it is necessary or appropriate for the public counsel to intervene or participate in Office proceedings are too restrictive and should be deleted, enabling the public counsel to take action whenever appropriate and not be limited by specific statutory language defining his authorization. Attention is directed to appendix A, which contains the society recommendations on specific statutory language of section 3(d).

[The information referred to follows:]

STATEMENT OF THE PATENT OFFICE SOCIETY

APPENDIX A

The following are the changes and reasons for same. Material to be deleted has been bracketed ([]), material to be added has been underlined.

Section 3.—Commissioner's and other officers

(a) There shall be a chief administrative officer of the Patent Office, the Commissioner of Patents, referred to in this title as the 'Commissioner'. The Commissioner shall be appointed by the President, by and with the advice and consent of the Senate, and he shall be compensated at the rate now or hereafter provided for level IV of the Executive Schedule pay rates (5 U.S.C. 5315). The Commissioner shall superintend or perform all duties required by law respecting the granting and issuing of patents and the registration of trademarks, and he shall have charge of property belonging to the Patent Office. The Commissioner is authorized to promulgate rules and regulations governing proceedings before the Patent Office and to prescribe such further rules and regulations which may be necessary for administration of the Patent Office, not inconsistent with law. [: to define any and all terms used in this title in connection therewith; and otherwise to prescribe such further rules and regulations as may be necessary or proper for purposes of administration of the Patent Office.] (1)

(b) There shall be a Deputy Commissioner of the Patent Office, who shall be appointed by the President, by and with the advice and consent of the Senate, and who shall be compensated at the rate of now or hereafter provided for level V of the Executive Schedule pay rates (5 U.S.C. 5316). The Deputy Commissioner shall perform such functions as the Commissioner may assign or delegate and he shall act as Commissioner during the absence or disability of the Commissioner or in the event of a vacancy in the Office of Commissioner.

(c) There shall be no more than three Assistant Commissioners of the Patent Office, who shall be appointed by the Commissioner and who shall be compensated at a per annum rate of basic compensation fixed by him not in excess of the maximum scheduled rate provided for positions in grade 18 of the General Schedule (5 U.S.C. 5104). Such Assistant Commissioners shall perform such functions as the Commissioner may from time to time assign or delegate. In the event of vacancies in the Offices of Commissioner and Deputy Commissioner, or their absence or disability, the Assistant Commissioner senior in date of appointment shall fill the Office of Commissioner until said vacancies, absences or disabilities terminate.

(d) There shall be in addition an Associate [Assistant] (2) Commissioner of the Patent Office for Appeals, Litigation, and Public Counsel referred to in this title as the 'Public Counsel', who shall be appointed by the President, by and with the advice and consent of the Senate. The Public Counsel shall be a person competent legal knowledge in the intellectual property field and possessed of scientific ability. [The position of Public Counsel shall be in the competitive service, and the] (3) The per annum rate of basic compensation therefor shall not exceed the maximum scheduled rate provided for positions in grade 18 of the General Schedule (5 U.S.C. 5104). The Public Counsel shall assure as an advocate, and through the adversary process, that high quality patents which meet the statutory and constitutional criteria therefor issue Public Counsel's approval, an adequate and competent staff for the Public from the Patent Office. To that end the Commissioner shall provide, subject to Counsel so that (4) he may (5) [shall] consider and review all *application* proceedings before (6) [in] the Patent Office, and he or his delegates:

(1) may intervene and participate at any time in the *above mentioned* (6) [any] Patent Office proceedings, or appeal therefrom, when, in his discretion, it is necessary or appropriate to do so [:] ; and

[(A) in the public interest to assure the integrity, strength, and reliability of a high quality patent system; or

(B) in circumstances which indicate the public need to analyze or defend an important, new, or developing theory of law; or

(C) in the case of important, new, or developing areas of technology; and]

(7) (2) shall prosecute or defend appeals from any final action of the Patent Office; and

(3) shall have all other rights and powers afforded parties under this title; and

(4) shall take such other action, participate in such other proceedings, and conduct such other investigations or inquiries, as may be necessary or appropriate to carry out the purposes of this title.

The Commissioner may also assign or delegate other duties to the Public Counsel, to the extent such assignment or delegation does not interfere with the responsibilities of the Public Counsel provided by this subsection. In all other respects, the Public Counsel shall be independent of the Commissioner in carrying out his responsibilities hereunder.

(e) The Commissioner shall, subject to other requirements of law, appoint other officers and employees of the Patent Office, assign or delegate to them the functions of the Office, and fix per annum rate of basic compensation therefor.

Section 4.—Restrictions on officers and employees as to interest in patents

Officers and employees of the Patent Office shall be incapable, during the period of their appointments and for *one year* (8) [three years] thereafter, of applying for a patent or, during such period and for one year (8) [three years] thereafter, being named as an inventor in an application for patent for an invention made during such period or for one year (8) [three years] thereafter and of acquiring, directly, or indirectly except by inheritance or bequest, any patent or any right or interest in any patent, issued or to be issued by the Office. Such applications for patent thereafter shall not be entitled to any priority due earlier than one year (8) [three years] after the termination of the appointment of such officers and employees.

Section 5.—Board of appeals

(a) There shall be in the Office not to exceed twenty-four examiners-in-chief, who shall be persons of competent legal and scientific knowledge in the intellectual property field (9) appointed under the competitive service, in the manner prescribed for Administrative Law Judges (5 U.S.C. 3105; 5362, 7521). The per annum rate of basic compensation of each examiner-in-chief shall be fixed at not in excess of the maximum schedule rate provided for positions in grade 17 of the General Schedule (5 U.S.C. 5104).

(b) The examiners-in-chief shall constitute a Board of Appeals in the Patent Office. [The examiners-in-chief shall be persons of competent legal knowledge and scientific ability, who will perform and exercise the judicial functions of the Office.]

(c) The Board of Appeals shall review all final orders (as that term is defined in (5 U.S.C. 551) of primary examiners and may review orders issued pursuant to Section 23 of this title, except with respect to such matters relating to Office procedure which the Commissioner has by general rule or regulation assigned for determination by a single member of the Board of Appeals, who shall from time to time be designated by the examiner-in-chief senior in date of appointment. Except as otherwise provided in this title, the Board of Appeals shall exercise all judicial functions, including all agency review of [or] appeals, under this title. The order of the Board of Appeals shall constitute final agency action (as that term is defined in 5 U. S.C. 551) in all matters considered by it, as shall the order of a single member in matters assigned for determination by him.

(d) Each appeal or other action shall be heard or considered by a panel of at least three members of the Board of Appeals, except as otherwise provided in subsection (c) of this section. Said panel shall be designed for each case by the examiner-in-chief senior in date of appointment, consistent with the provision of section 3105, of title 5, United States Code. The Board of Appeals has sole power to grant rehearings and/or reconsideration. (10)

(e) Whenever the Commissioner considers it necessary to maintain the work of the Board of Appeals current, he may designate any patent examiner of the primary examiner grade or higher having the requisite ability, to serve as

examiner-in-chief for periods not exceeding six months each. An examiner so designated shall be qualified to act as a member of the Board of Appeals. Not more than one acting examiner-in-chief shall be a member of the panel of the Board of Appeals hearing any appeal or considering any case. The Commissioner is authorized to fix the per annum rate of basic compensation of each designated examiner-in-chief in the Patent Office at not in excess of the minimum scheduled rate provided for positions in grade 16 of the General Schedule (5 U.S.C. 5104). The per annum rate of basic compensation of each designated examiner-in-chief shall be adjusted, at the close of the period for which he was designated to act as examiner-in-chief, to the per annum rate of basic compensation which he would have been receiving at the close of such period of such designation had not been made.

NOTES

(1) It is the Committee's opinion that the deleted phrasology is unnecessarily redundant and confusing. No reason to accent the power to define terms. Such power is an inherent power of an administrative law agency and such power should not be accented to the dereogation of other powers commensurate with the head of such an agency. Such phrasology may be interpreted as a grant of power above that intended.

(2) This position is independent of the Commissioner and thus it is felt the term 'associate' more aptly describes the position. Further, paragraph (c) above, limits the Office to three Assistant Commissioners and thus the use of 'Assistant' in paragraph (d) is considered ambiguous, as the question arises, is this position in addition or one of the three referred to in paragraph (c).

(3) The language is inconsistent, requiring the Public Counsel to be appointed by the President from the civil service. It is the Committee's position that the Office of Public Counsel should be filled by the most competent person available and the civil service requirement unduly restricts the prerogatives of the President to obtain the person most qualified for the position. To insure a high quality Public Counsel, the qualifications were broadly defined.

(4) The staff requirement reflects the need of the Public Counsel to be properly supported by the various administrative offices of the Patent Office in the performance of his duties, especially in the procurement of staff personnel.

(5) It is felt that the Public Counsel should have some discretion in reviewing Office proceedings. To review all proceedings would require a staff approaching that of the Office. Such a large expenditure of manpower and other resources would have a more pronounced effect on the Patent system if applied to examination. Further, the Public Counsel must be free to allocate his resources to areas of most critical and pressing need without being hampered by the statutory requirement to review *all* proceedings.

(6) The language has been made more specific to ensure the Public Counsel will not become involved in purely administrative matters as employee grievances and employee organization contract interpretation and negotiation.

(7) These lines considered overly restrictive in defining the scope of the Public Counsel's activities.

Circumstances may vary, and the Public Counsel must be free to allocate his resources wherever it is "necessary and appropriate to do so" without having to justify his motives and intentions in specific statutory language that may become obsolete with the changing nature of the law and the national interest in the intellectual property field.

(8) It is felt that in the age of compact prosecution, where applications are to issue within 18 months, the three year requirement imposes an unreasonable restraint on the right of former employees of the Office to own property. Further, as this title allows for publication of applications, the staff of the Office has only a limited knowledge (of what is significant) over that which is public. No need seen to expand over present law.

(9) The phrase "judicial functions" is objected to as unduly broad and uncertain. As the re-examination procedure requires the primary examiner to perform many of the functions of a hearing examiner and thus, in effect, the primary examiner performs quasi-judicial functions, the substituted language is preferred, as more exact. Further the Board does not review certain petitionable matters and thus the substituted language is preferred. (Petitions to make 'special', revive abandoned applications, etc.).

(10) Added to be more in line with Board of Appeal practice.

ADVERSARY PROCEEDINGS AS PART OF THE EXAMINATION PROCESS

Sections 122 and 135 of S. 1321 provide for publication of pending patent applications enabling adversary proceedings before the Office. The Patent Office Society favors in principle the publication of patent applications leading to an adversary proceeding.

To encourage inventors to disclose their invention to the public, the patent system provides the disclosing inventor with the exclusive rights to his discovery. This traditional quid pro quo has provided us with a patent system that has been effective in encouraging inventors to file patent applications, the Patent Office to issue patents and disseminate the information provided therein and thus through incentive and information dissemination, promote the progress of the useful arts. By publication during the examination process, this quid pro quo has been altered to: Inventor's disclosure to the public in return for a chance on an exclusive right to make, use or sell. The effect of this change on the incentive to file patent applications as opposed to seeking trade secret protection must be analyzed with care if we are to foster progress of the useful arts.

Competing with this legitimate concern, is the greater reliability that can be placed on the examination process and the resulting presumption of validity by an adversary proceeding. If the presumption of validity is weakened by the courts to a sham, the incentives to file will also be reduced as inventors realize that the patent they obtained can only be licensed or utilized with any degree of certainty after a lengthy and expensive court test. Patent owners, licensees or investors will be unwilling to tool up or incur other production costs without some degree of reasonable certainty of the protection afforded by the patent grant. Under such conditions the benefits the general public has experienced because of an expanding and marketed technology will wain. To provide for an adversary proceeding necessitates publication of the patent application. For this reason, the Patent Office Society suggests that the benefits to be reaped from adversary proceedings outweigh the disadvantage of disclosure of patent applications.

However, to minimize the disadvantages of publication with ensuing adversary proceedings, an additional provision may be added to S. 1321. In section 122, a provision may be inserted that upon payment of additional fee, an applicant may have the right to have his application kept in confidence until the Patent Office has indicated the claims allowable, provided the examination had not been deferred under section 191(a) of S. 1321. The effect of such a proposal would possibly be two examinations. The examiner would examine the application as is presently done, and after a finding of allowability, the case would become subject to an adversary proceeding. The Office would set the additional fee to provide compensation for the dual examination. This would enable applicants to maintain the quid pro quo of disclosure for exclusionary rights, and still enhance the presumption of validity by an adversary proceeding.

A possible undesirable consequence of adversary proceedings may be the ability of such to be used as a harrassment device. The danger is particularly apparent when one considers the effect a large corpo-

rate opposer could have on the individual applicant. To minimize such harassment possibilities, it is suggested that section 135(a) of S. 1321 be changed by striking: "until notice of allowance of a patent thereon" and substitute: "within such time as the Commissioner shall be regulation prescribe, but not less than 3 months." This would provide a specific time period within which all opposers must enter the proceedings. This would prevent a series of opposers from exhausting the applicant. Additionally, it is recommended that section 134(c) be canceled. The judicial review of the primary examiner's decision is most appropriate if made on the record. To provide otherwise would allow any party to institute the examination process of the board of appeals, thus unduly burdening the board, excluding the input of the examiner trained in the field, and providing an opportunity to frustrate the examination process by undue harassment. Finally, it is suggested that in section 134(d), requiring a transcript of the hearing be kept be stricken as unnecessary in a review upon the record and that the following be added:

The Board of Appeals shall have the right to assess cost of appeal to the losing parties as they deem appropriate.

This would discourage frivolous appeals solely for harassment purposes. With the above safe guards against harassment, the adversary proceeding may increase the presumption of validity, without unduly prejudicing those applicants with minimal resources.

To further protect the rights of applicants whose applications have been disclosed under section 122 of S. 1321, it is recommended that section 273 be changed to reflect the existence of a limited property right subject to divestment in the disclosed invention and thus provide an additional incentive for inventors to file and disclose to the public. In section 273(b) it is suggested that event two be changed to "unless otherwise so done, call the case up for examination under section 192 of S. 1321." This would accomplish two desirable results. The unauthorized practitioner would be encouraged to enter the proceedings as an opposer before the Office has gone through the examination process and indicated a claim allowable and second the applicant would not be prejudiced by a delay in indicating a claim allowable due to prolonged adversary proceedings. The right to damages is subject to the patent and relied upon claim, therefore it is considered proper to allow the rights to vest before allowance, thus affording the applicant possible protection from the time of disclosure to the public, thus conforming to the traditional quid pro quo of disclosure for exclusive rights.

MOVING ON TO DEFERRED EXAMINATION

Sections 191-193 of S. 1321 provide for deferred examination. The Patent Office Society favors in principle the establishment of a system of deferred examination.

Under the current conditions of examination of patent applications, the Patent Office disposes of over 100,000 applications yearly. The average examiner must dispose of an application in less than 15 hours in order to maintain the Office-wide production goals. An

obvious method of increasing the quality of the examination process is to provide for more manhours per patent application. Further, new procedures will be required by S. 1321, e.g., the adversary hearings, subpoena power, et cetera, which will necessitate additional manhours to be applied to each application. Deferred examination appears to be an acceptable method of reducing the examination workload thus enabling the Office to allocate more manhours per application.

The reduction of the number of applications going through the examination process will be caused by several factors under a deferred examination system. Currently, many applications and patents issuing thereon, are filed for defensive purposes. A corporation may not wish to exercise its exclusionary right as it merely wishes to obtain a patent to minimize the hazards of an infringement action by a subsequent inventor. Such applications need not obtain a full examination, as publication under section 122 of S. 1321 will provide the desired protection. Thus, that percentage of applications filed for defensive purposes only will not undergo the examination process. Further, many patent applications are filed with an uncertain economic value. Presently, these inventions may not be filed until the market conditions indicate the invention has reached its time. A deferred examination system will allow these inventions to be filed, disclosed to the public and deferred until market conditions are favorable. Such will produce earlier filing and disclosure and, if the market fails to materialize, the application can be abandoned thus reducing the examination workload. Deferred examination appears to be a viable method to increase the examining manhours without the necessity of the alternative, massive staff increases.

ON MAINTENANCE FEES

Section 41 of S. 1321 provides for the establishment of maintenance fees. The Patent Office Society opposes the use of maintenance fees as a revenue collection means.

Proponents of a maintenance fee system argue that maintenance fees are a valid revenue collection means as they place the burden on those who have successfully utilized a patent and thus benefited the most therefrom. The patentee who is financially successful in exploiting his invention will be in a much better position to pay the cost of the system than a patent applicant, who is yet unrewarded. Additionally, maintenance fees enable filing fees to be lower and thus encourage filing. Such advantages are not seen to outweigh the dangers of a maintenance fee system.

Maintenance fees are proposed as a means of collecting revenue for the operation of the Patent Office. The concept of requiring those who successfully utilize their patent to pay the costs of Patent Office operation infers that the patent system functions for the benefit of patent owners only. However, it must be recognized that the general public receives benefits from a system that offers limited protection of inventions in return for disclosure. By requiring maintenance fees, the quid pro quo of disclosure for protection has been altered by a condition subsequent, i.e. payment of fees. Such merely

becomes a penalty on success, requiring a successful patentee to undertake a large share of the burden of Patent Office operating expenses. Operating expenses that have no relation to his successful use of his patent, and which are inflated by examination costs of frivolous and unpatentable inventions. A proposal for the collection of revenue must have as its basis an apportionment of costs in accordance with certain equitable concepts. Maintenance fees, by taxing success independent of costs incurred by the Patent Office that preceded such success, does not share the cost burden equitably.

Mr. Chairman, thank you for this opportunity for the Patent Office Society to testify before this committee.

Senator HART. We appreciate the opportunity to hear from you as a spokesman for the men and women who are really on the front line operation of this whole business.

We attempted to develop for the record some understanding as to how the American Patent Law Association and the ABA, developed a position with respect to the issues before this committee. I should ask you those same questions.

You say you represent about 1,100 of the personnel in the Patent Office.

Mr. DUNNE. Yes, sir.

Senator HART. You are presenting a position.

Who decided it?

Mr. DUNNE. The Patent Office Society is composed of four officers, plus their executive committee, which is the advisory and policymaking organization of the society. We also have various standing committees, one of which is the legislative committee that I am chairman of. All matters dealing with legislation are referred by the executive committee for study to the legislative committee. The legislative committee, by our constitution, must have at least five members. Currently, it has 11.

We study in committee work the various proposals and various pieces of legislation and report these proposals back to the executive committee. The executive committee then would disapprove, approve, alter, or modify our recommendations. Normally our recommendations go through extensive review by the executive committee. It is not a rubber stamp process. These positions come through the legislative committee and the executive committee.

Senator HART. The members, in the case of both committees, being employees of the Patent Office?

Mr. DUNNE. Yes, sir. The Patent Office Society—let me make it clear here—is an organization whose membership is not limited to Patent Office personnel. Our membership is open to members of the patent bar, patent agents, Federal judges.

What we have done in the society is organizing people. People are doing the work of the society. Voting members are Patent Office employees; so are all the members of the executive committee. All of the officers and all of the members of my legislative committee are Patent Office employees. Some are in trademarks, and some in patents.

Senator HART. I raise this without being at all sure of the answers.

You made the point when you began that you were testifying, that you were present here—how did you phrase it?

Mr. DUNNE. On annual leave. I am doing this because I am an employee of the Patent Office. I am not speaking here in support of the administration policies. I am here in support of the Patent Office Society policies. For that reason, I am here on my own time, being as it is, a normal Government workday. I have taken annual leave, that is, my vacation time to appear before the committee. This way I am sure to maintain my own independence as an employee.

Senator HART. I do not have the foggiest idea as to what the ideal way would be to handle that.

Would it make any difference if you were here supporting line by line the administration's position?

Mr. DUNNE. It would not make a difference if I were here supporting line by line the administration position because it was the administration position. If I were supporting the administration position because the society believed in it, it would make a difference, yes.

For the record, we are in conflict here, and it is normal for Federal employees when they appear before Congress to only appear for information purposes only, I am not here for information purposes only. I am supplying policy recommendations, and I would like it clearly made known that I am appearing ex officio from my duties as a Federal employee.

Senator HART. It reflects a sensitivity that is admirable. I am not sure of the answer in general, and yet you wonder. The time you take and the information you give this committee combine to advance the performance of the whole Government. Maybe I am glad I am not the Commissioner. If you had come to me and said, I want to go on Government time, is it all right, I don't know what I would have told you.

Mr. DUNNE. To respond to your statement, as an observation, the Office has not suggested or has not even hinted that I take annual leave. This is my own decision.

Senator HART. Have you had an opportunity to hear or read the testimony that has preceded yours here?

Mr. DUNNE. Senator, yes, sir. I was here for the Commerce Department and the Justice Department's positions. I am also familiar with the positions taken by the organizations yesterday, particularly the ABA position. I am a member of the ABA patent section. I am aware of their position.

Senator HART. While you have responded to the five items that we asked for discussion in this hearing. I am not sure we will have another opportunity to get from somebody who is in the day-by-day routine, the ideas and suggestions that others in the firing line areas of how we could improve the performance of the Patent Office.

Do you have any suggestions not incorporated in the reform bill that would be helpful?

Mr. DUNNE. Senator, due to limitations of time of the Patent Office Society, we did this on our own time. We do not have the staff and whatnot that other organizations do to go into this fully. We have not gone into it and I could not give you an answer as the

Patent Office Society position. I would have to answer these questions purely on my own feelings, which are in no way indicative of the society.

Senator HART. Having explained that and narrowed it to your own opinion, do you have any opinions that you would like to present to the committee other than in the areas that you mentioned?

Mr. DUNNE. I feel the committee, particularly in drafting S. 1321, has really narrowed down and pinpointed some of the problems in the Patent Office procedures that are detrimental to the patent system. I think an excellent job has been done here to pinpoint the problem areas.

In answer to your question, no, I have nothing offhand that I could come up with right now; even after detailed study nothing would be as influential as the changes that are recommended here.

Senator HART. Specifically, I think particular reference was made to it in the prepared testimony. Hence, probably it would not be a position taken by the society.

What is your own opinion as to whether examiners would be enable more effectively to perform their responsibilities if the mechanized search facilities called for in the bill were available?

Mr. DUNNE. Senator, the society supports the concepts of mechanized search. I think the society is also aware, and I personally feel the same way, that mechanized search is a very valuable research tool for the examiner. Its practicality and implementation however, is limited by current technology.

We have a problem now that an examiner, when he picks up a patent application, knows the technology, has been working with it. He knows the limits where he should search, and he makes a subjective decision. It may be made differently by another examiner on the same case. He searches those areas of technology. Decisions of where to search and what to search are made by individual examiners based on their experience. That may differ.

Also, in mechanized search the input into the system has to be made by someone other than an examiner, for example, what we now call classifiers in the Patent Office. These people are charged with the responsibility of classifying the documents in the proper manner. To really see a patent document and pick out the words that would fit into the computer, to trip the mechanized system, requires knowledge of the case that you are working on, to know what is appropriate. Mechanized search is used in areas where it's practicality is limited to.

I had a mechanized search in my art. As an examiner I would use the mechanized search. However, I would not trust it and I would go back to manual search unless I found a patent reference. Other than that, I would have to go back and search it. It just is not recommended.

Yes, I would love to see real mechanized search, if feasible.

Senator HART. There was some testimony yesterday that the search facilities of the office as of now are inadequate.

How do you react to that?

Mr. DUNNE. I think the Patent Office has quite a large and extensive scientific library, and a very competent staff in that library, and

I feel the patent publications are obviously all available. We are missing a lot of trade journals and a lot of disclosures that are made in conferences, particularly foreign conferences. Various abstract services provide a lead on this, particularly in areas such as chem abstracts, in my area, engineering abstracts are used in the biomedical engineering fields.

Other than that, we would not have them unless we request the article by name, if it is not there. I think it is not a failure on the part of the office or the system that there is such a voluminous amount of information that is being promulgated daily by the Western technical society that to keep tabs and have it all classified for the examiner is an impossible task. We have to rely on independent judgment of the examiner to know where to look, and know where to look where he feels he might find something that might tell him where to look.

It can be improved. It will never be to the point where it could not be improved.

Senator HART. The requirement for the patentability brief—I take it you support it and it would in part insure a fuller appreciation of elements that were involved in the application.

Is that right?

Mr. DUNNE. The Society has not gone on record or cannot go on record right now on patentability briefs. We have not studied it. As an examiner I would appreciate a patentability brief because it does some of my job for me. Whether this in any way would affect the patent system, I really don't know.

Senator HART. As you say, if it would ease your job—

Mr. DUNNE. I did not say it would ease it. It would do some of my job for me, possibly it could be more beneficial to the system if the examiners were doing their own jobs out of their own resources and creativity.

Senator HART. You say that the average examiner must dispose of an application in less than 15 hours in order to obtain the office-wide production goals.

Mr. DUNNE. Yes, sir.

Senator HART. Is it possible to determine how much time is necessary for a valid search?

Does it depend on the kind of examiner?

Mr. DUNNE. It depends, not to get too technical, but getting into some of the language we use in the office, we have what we call combination and subcombination claims. A combination claim would include a variety of elements. For example, in the biomedical field, I have anaesthesia machines and respirators. I get a claim on anaesthesia machines. That would dictate my search. If the claim were to improve the pressure release valve on the machine, I would search valves. If the claim was an anaesthesia machine with this valve on it, then I would have to search anaesthesia machines and valves. So it is dictated by the scope of the claim.

The classifying system within the Patent Office also dictates search areas. For example, if an application is classified in a specific subclass within a specific class, the class definition will also direct that examiner to searching other classes, which have become known

by the great multitude of experience that likely pertinent art may exist there. So some searches are dictatorial in the sense that when you start a search, you know one subclass. That subclass definition tells you there are others where you must go to do an effective search, and they may say others.

So these two influences would indicate where an examiner may search. You have the mandatory search fields dictated by the classification definitions and that dictated by the claims.

Senator HART. The sentence that I read—and I will reread—the average examiner must dispose of an application in less than 15 hours in order to obtain the office-wide production goals.

Mr. DUNNE. As far as search is related, this is the most time consuming aspect.

Senator HART. Tell me—we have asked whether there is a quota system. There is a general reluctance to admit to quotas in anything these days. Clearly nobody in the department is acknowledging that there is a quota system that works in the patent office, but you have got yourself an average here to maintain the office-wide production goals.

Call it what you will, does that not mean that an examiner is under an obligation to move so many files in such a period of time?

Mr. DUNNE. The goals are set for each examiner. They would average less than 15 hours. The goals are not mandatory in the sense that if you do not maintain your goal, that you will be severely reprimanded. The goals are the criteria that are used to evaluate performance, promotional considerations as distinguished between a raise. An examiner may get a raise and not obtain his goal. His yearly increase is based on experience, but a promotion requires an attainment of the goals, or if you have not met the goals, a greater standard of quality which would justify. The office has a quantity-quality balance here.

Senator HART. A fellow would be much more comfortable if he had met the quantitative standards than have to argue that he had met the qualitative standards. It is always easier to prove figures.

So isn't there some built-in pressure there to move to make sure you are right with the figures?

Mr. DUNNE. Yes, sir, there is. This pressure extends not only to the way you would examine application, but what type of work you will do at a specific time. We have our minimal accounting period—it is a 2 week accounting period, measuring an examiner's production. You go through your first week, and you obtain a certain amount of actions. And then the office demands that you do other type of actions. There is a lot more than numbers. You have to balance the type of work. There is a lot to influence how you may go about it and what cases you pick up.

If you could repeat the question.

Senator HART. Simply, if promotion, not just annual rate, literal promotion depends on meeting either a quantity or a quality standard, the question is, doesn't that mean that there is pressure?

Is not human nature such that the examiner is going to make darn sure he meets the numbers because it is easier to prove.

Mr. DUNNE. Most definitely, most examiners are aware of the goals and chart their yearly work to approach these goals. Most definitely yes,, sir.

Senator HART. Whether the question of promotion hinges on having met the quantity goal or satisfying your superior that you had met the quality goal, whichever is the stronger motivation on the part of the examiner, is there a bias built into the system in favor of allowing a patent rather than disallowing a patent?

Mr. DUNNE. Senator, I would say there is not a bias built in allowing a patent because one of the statistical numbers that are used to evaluate performance is the percentage of allowance. I know the Patent Office will never say they have denied promotion or recommended promotion based on that number. The examiners put a premium on that number. They know that the man before them on that docket was getting 70 percent of the cases allowed, 30 percent abandoned. That might not be his figure. He knows that if his numbers are 80 percent allowance, then he is doing something different than the other examiner before him did. He adjusts it accordingly. He uses that as his own personal check. That would be the only pressure or input from the statistical numbering system on allowances.

The goals may affect the amount of time spent on a case. They would not affect how he would dispose. The system does not force the examiner to issue or abandon. It does not put any pressure on him in this regard. It may affect the time that he spends reaching an issuance or having the case abandoned, not the result.

Senator HART. Quality in the product reflects in part the amount of time he puts into it.

Mr. DUNNE. Yes, sir, Senator.

In anything you do, the more time spent, the better quality. The examining corps puts a very high premium on the allowability of claims over the art where they should be searching.

Because of the pressures of time, the first things that may go may be checking of spelling, syntax, grammar. If you talk to the older examiners, they are nitpickers on spelling and punctuation, while that does not happen anymore because of the pressures of time. The examiners do an adequate search, I would feel. The pressures of producing cases at a certain hourly rate are not that strong that they affect the areas of search. They may affect other areas of insignificant consequence.

Senator HART. Insignificant?

Mr. DUNNE. Less significant than the actual search against the actual time.

Senator HART. Whether or not that may be of lesser, consequence, do they bear on the likelihood of making a proper decision in respect to the question of patentability?

Mr. DUNNE. I would say generally no. They might be more in the line of having a document that meets the high standards required

As far as the claims themselves, on allowability, no.

Mr. Tegtmeyer talked about this point, and I have to agree with him wholeheartedly, that searching as I mentioned before, is directed, mandatory in certain areas, and some at the discretion of

the examiner. Once you get beyond that area, if you think about concentric circles, next you get to the next circle, you are greatly increasing the search area. If you are going to look there you might as well look all around the circle. Everytime you add to that circle, you are just increasing the search time with minimal and more minimal chance of finding anything pertinent.

Senator HART. The Patent Office opposes and your Society supports the deferred examination system.

Now, the Patent Office suggested that deferred examination would not save very much time.

How do you react to that, save very much time for the examiners.

Mr. DUNNE. This becomes a statistical interpretation. For example, several witnesses have tossed around the figure of 60 percent, in the Netherlands. Many of those applications were never examined because they received a prior examination in the United States, thus the applicants, who might also have been U.S. applicants, decided that the U.S. examination did not show anything of value could be obtained. There would be a lot of influences we would not have on a deferred examination in the United States.

Another input into that statistic on a deferred examination system. It encourages filing of an application for several reasons. One, you have two fees, the filing fee and the examination fee, so you are encouraging filing. Also, since you have deferred examination system, which I think is a strong advantage to it, corporations or inventors would file an application before commercially their time is due because they could defer it. Inventions would be disclosed earlier, and this would be a benefit to the public.

With this you might get a very large increase in the number of filings. For example, the Patent Office in the last calendar year had 115,000 applications. Deferred examination might skyrocket that figure. If that happens, we may still be examining 115,000 only examining 40 percent, thus we may not be gaining anything. We don't know. We would have to check the reaction of the patent community on this.

The Society feeling is that there are two types of patent applications that will not be examined on prior art. These types of patent applications are those that are made for defense purposes to prevent subsequent harassment, and those people who are waiting for their time to come. These will not be examined under deferred examination.

Because of that, we feel that there will be a reduction. The specific number would be hard to predict.

One more comment. One reason we support deferred examination in the view of this possible balance of arguments here and thus a close question is the fact that S. 1321 provides that any party can call an application up for examination, including the Public Counsel. Deferred examination could prove to be a handicap to the patent system. The Public Counsel, at the risk of losing fees, could order up all examinations to be examined by his own authority, and do away with deferred examination. Therefore, the Society feels it is worth a try to see how these numbers are going to balance out. We cannot predict—we are not going to do any harm if we try it.

Senator HART. I am glad you reminded me that no harm would be done if in fact the Public Counsel could call them up. Assuming that the number of applications does not skyrocket, would it not follow logically that the deferred examination would permit a higher quality of work product from the examiner?

Mr. DUNNE. The society feels it would definitely increase the manhours available per application. That would possibly increase the quality, it probably would increase the quality, yes.

However, various sections of 1321 are going to institute procedures that are going to require more time. For example, subpoena power alone. If we start getting into discovery procedures during the examination process, I am sure you are aware that the discovery process during litigation is horrendous. If we start bringing these procedures to the Patent Office, we are not going to be talking about 15 hours per case. We are going to be talking about 2 weeks just on discovery alone. So we had better have deferred examination if we are going to have subpoena power and discovery.

Senator HART. Even that conditional answer hinges on whether the subpoena produces, a lot more work.

You favor the making of an independent agency of the Patent Office, and you say—and this is very early in your statement the first page—“decisions of policy affecting the patent system are influenced by the Secretary of Commerce who is charged with furthering American business interests.”

Do you have any specific example of how this relationship with the Secretary of Commerce has affected the Patent Office?

Mr. DUNNE. Senator, I am not privy to the inner councils of Government, so I really could not answer that. I can conjecture on types of situation that there may be influence, but to say there has been influence, I could not say or would not want to suggest that there has been.

I think the point here—there is a propensity for this influence. This influence might be rightly so. The Secretary of Commerce is charged with furthering America's business interests. The American business has a large place in the patent system, particularly when you are talking about technological societies. Businesses are technologically oriented. This input may be very proper.

Our point is, in furthering—in being charged with furthering—the progress of American commerce does not necessarily go hand in glove with furthering technology in the patent system. I am talking very generally now. I am not trying to suggest that this has happened.

But, as an example, the recent Deep South case decided by the Supreme Court said an American manufacturer who is making a patented machine in parts to be shipped abroad and assembled would not be infringing on a patent on a complicated machine—in this case, it put the shrimp in one end and it comes out boxed and frozen—it is a very complicated machine. If you can assemble it in the United States and ship it to a foreign country, to be bolted together with three bolts, you would have a device that you would not be infringing the patent in America. This upsets a lot of people.

However, it has advantages to public policy. It would suggest that

manufacturers who want to compete in marketing a shrimp-making machine, do not have to go abroad to their market to set up manufacturing facilities. They can set them up here in the United States, use American labor, American materials, American capital. Here we have a situation where the patent policy, or the patent people, may feel that it is inappropriate to allow American firms to manufacture a patented device in parts and such is, in fact, making the device, infringing a patent while American business interests may seem to indicate that this was very good, because it helps the American company, the balance of trade, and the rest.

These types of conflicts of interest would exist in making decisions on marketing patents. I think these kinds of influences are proper, but they should not be the orientation of a man who oversees operations as the Secretary of Commerce. He does have oversight power. There may be possible conflicts.

Again, I would like to make perfectly clear I am not suggesting this type of discussion has ever gone on in the halls of Commerce. This is the type of example I could dream up.

Senator HART. You have made it clear that you are not suggesting that either proper or improper influences have been exercised. But you do suggest there is a propensity, or inherent possibility?

Mr. DUNNE. Yes, sir, I do.

Senator HART. Do you, as an individual, have any opinion as to whether the frequent changes in the person of the Commissioner of Patents, a tradition that goes over a long history, affects adversely the morale of the personnel in the Patent Office?

Mr. DUNNE. That would depend about the feelings about the Commissioner in office at the time. I have been through three Commissioners. I believe it is harmful, sir. I most definitely do. I think it has an adverse affect on morale. Continuity of programs, that are the basic programs in the operation of the Office have been maintained. I have been in the Office under Commissioner Schuyler and Commissioner Godtschalk and now Commissioner Tegtmeier.

There has been a continuity of programs. There have been innovative programs come in under the different administrations which I think is good. But I think three Commissioners within 3 years is a bit out of hand. Of course, if we go back 5 years, they number more. Effective management cannot be done by a 1-year Commissioner, particularly in the Patent Office.

In the Patent Office, we have a group of professionals that are fairly unique in Federal service. They are fairly unique anywhere. They are trained as engineers, scientists, highly well educated technical people. Most have a law degree or are attending law school. We have an unusual profession, not one that can be managed by fiat, one that can be managed only by having faith in the programs, particularly when you get to the upper management levels.

For a Commissioner to effectively manage or administer—as opposed to policy—to effectively administer the Office requires great confidence from his Directors and his supervisory primary examiners and the examiners themselves. We are an independent group of employees.

I think it is very harmful, the changeover. We do not have trust, faith, or confidence in the everchanging leader type of concept, which is definitely harmful.

Senator HART. Mr. Brennan?

Mr. BRENNAN. No questions.

Senator HART. Mr. Nash?

Mr. NASH. No questions.

Senator HART. Mr. Dunne, thank you very much.

Mr. DUNNE. Thank you, Senator.

Mr. BRENNAN. Mr. Francis Browne.

Senator HART. Mr. Browne, I think you joined us to discuss the aspect I was last talking about with Mr. Dunne.

Mr. BROWNE. Yes, Senator.

STATEMENT OF FRANCIS C. BROWNE, ESQ.

Mr. BROWNE. My name is Francis C. Browne. I am the senior partner in the law firm of Browne, Beveridge, DeGrandi & Kline, and a member of the bar of the District of Columbia and Maryland.

My own personal background is—I started in patent work in 1938. I am admitted to practice before the United States and Canadian patent offices. Some of my early patent practice was in industry and government. Since 1945, I have been continuously engaged in the private practice of patent, copyright, and trademark and unfair competition law here in Washington.

I have held office in and served on the board of managers of the American Patent Law Association. I have been chairman of various committees of the American Bar Association Section of Patent, Trademark, and Copyright Law. I am a past chairman of the patent section of the Bar Association of the District of Columbia.

I have served as a consultant to the House of Representatives Committee on Science and Astronautics on the subject of Government patent policy and also as an adviser to the Organization of American States on patent and trademark matters.

I am submitting this statement on my own personal behalf and not on behalf of any organization or client. So far as I know, no organized bar association has considered the proposal I am about to make. However, in discussing the substance of my proposal with some former Commissioners of Patents and other highly regarded members of the patent bar, they have indicated that the idea has some merit and have expressed surprise that it has not been suggested before now.

I am interested, particularly, in the administrative process by which the patent system operates in implementing the statutes enacted by Congress under article I, section 8, of the Constitution. The key to efficient administration of the patent statutes and effective operation of the U.S. patent system, in my opinion, lies in bringing the organization and function of the U.S. Patent Office more directly under the control of Congress.

By way of historical background, it can be recalled that Congress, in exercising its powers under the Constitution to promote the progress of science and useful arts enacted the first patent law in 1790.

The authority to grant patents for discoveries of inventors was placed in the hands of a three-member board—the Secretary of State, the Secretary of War, and the Attorney General.

There were no independent agencies in the executive branch at that time, so Congress placed the administrative responsibility for implementation of the statute in the State Department, that being the seniormost Cabinet department at the time.

Three years later, however, the three-member board was abolished and the examination system which existed during that time was abolished. They then went to a system of registering the patents, so to speak, and granting patents merely on the filing of an application. So it was really a clerical function, which was assigned to the Secretary of State. And in 1802, when James Madison, was Secretary of State—he established a separate division in the department for issuing patents and appointed a Dr. William Thornton to fill that position. And he later adopted the title of Superintendent.

In 1816 Madison became President, and in a special message to Congress, he urged that the Patent Office be given the status of a separate bureau. However, it was not until 1836, when the examination system was reinstituted and the patent laws were revised extensively, that the Patent Office became a distinct and separate bureau, the Commissioner of Patents being appointed by the President with later that jurisdiction was transferred to the Department of Commerce. I will come to that point later.

When the Patent Office was established in 1836, copyright matters were retained in the Department of State. But in 1859, the responsibility for those matters was also transferred to the Department of Interior, whereupon the Secretary of Interior gave the Commissioner of Patents the responsibility for copyrights and a Librarian of Copyrights was appointed in the Patent Office.

When the next major revision of the patent laws went into effect in 1870, the copyright function was turned over to the Librarian of Congress, an arm of Congress itself, and the Patent Office was given, instead, the responsibility for administering the newly enacted trademark statutes. That is the first time that the Patent Office had anything to do with trademarks. Four year later, as an adjunct to the trademark operation, the responsibility for registration of copyrights for prints and labels used with manufactured goods was taken from the Copyright Office and given back to the Patent Office. In 1939, this function was finally returned to the Copyright Office in the Library of Congress.

By Executive order issued in 1926, jurisdiction over the Patent Office was transferred from the Department of Interior to the Department of Commerce. I make special note of the fact that that was by Executive order, not an act of Congress. This was the first step towards diminishing congressional control over the Patent Office and dilution of the authority of the Commissioner of Patents.

In 1933, 1 year after the Patent Office was moved into the Commerce Building at 14th and SE Streets, the Secretary of Commerce actively injected himself into the management of the Patent Office by appointing a Patent Office Advisory Committee to assist him in

matters of general policy. For that committee, he drew upon personnel from industry, general law, and patent law.

Now, in 1950, under Reorganization Plan No. 5, the Secretary of Commerce vested in himself—again by Executive order—all of the functions of the Patent Office and then redelegated them to the existing Commissioner of Patents. When the patent laws were revised and codified 2 years later, in 1952, Reorganization Plan No. 5 was codified in the patent statutes, and the authority was given the Secretary of Commerce to vest in himself all the powers and functions of the Commissioner of Patents.

Although such powers have been redelegated to the Commissioner, as was the case under Reorganization Plan No. 5, there has been an increasing tendency on the part of most recent Secretaries of Commerce and Assistant Secretaries of Science and Technology to exercise greater policy and operational control and domination over the Patent Office and the Commissioners of Patents.

Thus, we have an anomalous situation where one Presidential appointee has the power and authority to completely strip another Presidential appointee of all his duties and functions with or without cause or reason.

To the extent that, in the first instance, success of the United States patent system is the responsibility of Congress, it would seem that Congress should not allow the Patent Office to be submerged several layers deep in a Cabinet Department of the executive branch. The analogy between the granting of a patent and the granting of other limited franchises by regulatory or quasi-judicial independent agencies or commissions leads one to the logical conclusion that the Patent Office should also be an independent agency or commission more directly responsible to Congress.

The proposal which I submit for your consideration at this time, Mr. Chairman, is really in the nature of an extension of the concept set forth in sections 2, 3, 5, 134, and 145 of Senator Hart's bill 1321. This would reestablish the Patent Office as an independent agency in the executive branch of the Federal Government.

Basically, I propose that instead of merely having a Commissioner and a Deputy Commissioner, as proposed in your bill, S. 1321, there be established as an independent agency a five-member U.S. Patent Commission, the administrative structure of which would correspond to that of existing Federal franchise-granting or quasi-judicial commissions, such as the Federal Power Commission, Interstate Commerce Commission, Federal Communications Commission, or the Civil Aeronautics Board.

I would suggest that the members of the Patent Commission which I propose be appointed by the President with the advice and consent of the Senate, each of the members, however, to be appointed for overlapping terms of 7 years, as in the case of other commissions. Likewise, not more than three members of the Patent Commission should be from any one political party, and the President should designate one of the members of the Commission to serve as chairman. By the way, this parallels the Federal Trade Commission Act; it is the statutory language. In this way, there would be greater continuity of service of Commissioners with the

consequence of greater consistency in the administration of the patent laws. This is the point that the previous witness from the Patent Office Society made, and I very strongly support his conclusion in that regard.

I also propose that the Commission appoint, under the Civil Service System, as many Administrative Law Judges—or, as they used to be called, Hearing Examiners—as may be necessary to perform the duties presently being performed by the examiners-in-chief who are now serving as members of the Patent Board of Appeals and the Board of Patent Interference Examiners. This proposal differs from section 5(a) of S. 1321 in that it would eliminate the title of examiners-in-chief and substitute the more current, consistent and meaningful title of administrative law judges. They would be on the same pay-scale relationship as provided in S. 1321.

Instead of conducting hearings in panels of three members each as provided in Section 5(d) of the present bill and limiting the record to that made before the patent examiners, as is presently the practice, I would suggest that the administrative law judges individually hear testimony, receive evidence, and obtain proposals for further amendments to the claims, prepare and file findings and conclusions, and be authorized to make final disposition of cases brought before them after final rejection by the primary examiner.

The applicant—or in inter partes cases, the dissatisfied party—could request the Commission to review exceptions to the findings and conclusions of the administrative law judges. From the final decision of the Patent Commission on those exceptions, judicial review could be had before the U.S. Court of Customs and Patent Appeals on the record made in the Commission, including the evidence submitted to the patent examiners as well as that submitted to the administrative law judges.

If the foregoing recommendation is adopted, I then recommend that the so-called trial *de novo* in the U.S. District Courts, as provided under sections 145 and 146, be abolished, since the presentation of evidence before the administrative law judge and the Patent Commission would eliminate the necessity for that type of judicial review.

If I may add a footnote, recent cases which I have noted since this statement has been prepared, I find that the so-called *de novo* affect of the trial in the District Court is more of a dream than a reality. There are cases that say that the evidence introduced in a trial *de novo* should be limited to that which was introduced in the Patent Office and relate only to issues presented in that Office.

Finally, I would leave the entire trademark registration function in the Commerce Department, separate from the Patent Office, since it is a purely ministerial or registration function arising under the Commerce clause of Article I, Section 8 of the Constitution, not under the Patents and Copyright clause. Another reason for separating this function from the Patent Commission is that trademark jurisprudence arises primarily out of the common law, whereas patents and copyrights are Congressionally created franchises which are constitutionally based statutory exceptions to the common law.

Here I may be treading in an area I am not as well informed as I should be. I am advised that there is a jurisdictional dichotomy

between the Senate Commerce Committee and the Senate Judiciary Committee with respect to the Patent Office. Whereas the Judiciary Committee exercises jurisdiction over the substantive and administrative organization of the Patent Office, the Commerce Committee exercises jurisdiction over the rest of the Commerce Department, including the offices of the Secretary of Commerce and the Assistant Secretary of Commerce for Science and Technology. Yet, the Secretary of Commerce, under section 3 of the Patent Act, has placed the Patent Office under the jurisdiction of the Assistant Secretary of Commerce for Science and Technology, and thereby submerges the Patent Office to a more subordinate position than it held prior to the promulgation of Reorganization Plan No. 5.

By taking the Patent Office out of the Commerce Department and making it an independent Patent Commission, it will be more directly under the control of Congress and answerable primarily to the Judiciary Committees of both the Senate and the House. This would be consistent with the spirit of article I, section 8 of the Constitution, since the Copyright Office, being a part of the Library of Congress, is presently an arm of Congress, and the Patent Commission would be both a separate agency in the executive branch and be more directly responsible to Congress than in its present posture.

The patent system, to be more effective, should be operated by a commission having continuity of personnel which is not subject to change merely because of changes in Cabinet or sub-Cabinet level officials. The appointment of Commissioners to the Patent Commission for overlapping terms of 7 years each would also reduce the disruption presently encountered as a result of Presidential elections every 4 years and the turnover in the office of Commissioner and Assistant Commissioners due to the uncertainty of tenure.

In conclusion, it is recommended that the Patent Commission concept be adopted to make the administrative structure of the Commission conform to existing patterns of organization within the executive branch, rather than continue making the Patent Office and the operation of the patent system an exception to the normal structure and operation of administrative agencies.

A marked-up copy of sections 2, 3, 5, 134, 145, and 147 of S. 1321 is appended here for purposes of illustration as to how this could be incorporated in the present bill without doing violence to the bill.

[The material referred to follows:]

S. 1321, 93D CONG., 1ST SESS.

A BILL

For the general reform and revision of the Patent Laws, title 35 of the United States Code, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, in accordance with the authority granted by article 1, section 8, clause 8 of the United States Code, entitled "Patents", is hereby amended in its entirety to read as follows:

"TITLE 35—PATENTS

"PART	Sec.
"I. PATENT COMMISSION -----	1
"II. PATENTABILITY OF INVENTIONS AND GRANT OF PATENTS.-----	100
"III. PATENTS AND INFRINGEMENTS OF PATENTS -----	261

"PART I—PATENT COMMISSION

"CHAPTER	Sec.
"1. ESTABLISHMENT, OFFICERS, FUNCTIONS -----	1
"2. PROCEEDINGS IN THE PATENT COMMISSION -----	21
"3. PRACTICE BEFORE THE PATENT COMMISSION -----	31
"4. PATENT COMMISSION FEES -----	41

"CHAPTER 1.—ESTABLISHMENT, OFFICERS, FUNCTIONS

"Sec.

- "1. National Patent Policy.
- "2. Establishment and seal.
- "3. Commissioners and other officers.
- "4. Restrictions on officers and employees as to interest in patents.
- "5. Board of Appeals.
- "6. Library, classification of patents, public search facilities.
- "7. Certified copies of records.
- "8. Publications.
- "9. Annual report to Congress.
- "10. Advisory Council on the Patent System.

"§ 1. *National Patent Policy*

"It is hereby declared to be the national patent policy of the United States to promote the progress of science and useful arts, by granting inventors the privilege, for a limited time and subject to the provisions of this title and any other Act the Congress has or may hereafter enact, to exclude others from making, using, and selling new and useful inventions discovered by such inventors and fully disclosed to the public. This title shall be interpreted in light of this policy and of the constitutional purpose permitting Congress to enact a patent law, to assure that United States patents are of high quality and reliable.

"§ 2. *Establishment and seal*

"The Patent Commission, at times referred to in this title as the "Commission", shall be an independent agency, where records, books, drawings, specifications, and other papers and things pertaining to patents and to trademark registrations shall be kept and preserved, except as otherwise provided by law. The Commission shall have a seal with which letters patent and papers issued from the Commission shall be authenticated.

"§ 3. *Commissioner and other officers*

A commission is hereby created and established, to be known as the United States Patent Commission (hereinafter referred to as the commission), which shall be composed of five commissioners, who shall be appointed by the President, by and with the advice and consent of the Senate. Not more than three of the commissioners shall be members of the same political party. The first commissioners appointed shall continue in office for terms of three, four, five, six, and seven years, respectively, from the date of the taking effect of this Act, the term of each to be designated by the President, but their successors shall be appointed for terms of seven years, except that any person chosen to fill a vacancy shall be appointed only for the unexpired term of the commissioner whom he shall succeed: Provided, however, That upon the expiration of his term of office a commissioner shall continue to serve until his successor shall have been appointed and shall have qualified. The President shall choose a chairman from the membership of the Commission. No commissioner shall engage in any other business, vocation, or employment. Any commissioner may be removed by the President for inefficiency, neglect of duty, or malfeasance in office. A vacancy in the commission shall not impair the right of the remaining commissioners to exercise all the powers of the commission.

"(d) There shall in addition be an Assistant to the Commission, referred to in this title as the 'Public Counsel', who shall be appointed by the President, by and with the advice and consent of the Senate. The position of Public Counsel shall be in the competitive service, and the per annum rate of basic compensation therefor shall not exceed the maximum scheduled rate provided for positions in grade 18 of the General Schedule (5 U.S.C. 5104). The Public Counsel shall assure as an advocate, and through the adversary process, that high

quality patents which meet the statutory and constitutional criteria therefor issue from the Patent Office. To that end he shall consider and review all proceedings in the Patent Office, and he or his delegates:

"(1) may intervene and participate at any time in any Patent Office proceeding, or appeal therefrom, when, in his discretion, it is necessary or appropriate to do so:

"(A) in the public interest to assure the integrity, strength, and reliability of a high quality patent system; or

"(B) in circumstances which indicate the public need to analyze or defend an important, new, or developing theory of law; or

"(C) in the case of important, new, or developing areas of technology; and

"(2) shall prosecute or defend appeals from any final action of the Patent Office; and

"(3) shall have all other rights and powers afforded parties under this title; and

"(4) shall take such other action, participate in such other proceedings, and conduct such other investigations or inquiries, as may be necessary or appropriate to carry out the purposes of this title.

The Commission may also assign or delegate other duties to the Public Counsel, to the extent such assignment or delegation does not interfere with the responsibilities of the Public Counsel provided by this subsection. In all other respects, the Public Counsel shall be independent of the Commission in carrying out his responsibilities hereunder.

"(e) The Commission shall, subject to other requirements of law, appoint other officers and employees of the Patent Commission, assign or delegate to them the functions of the Commission, and fix the per annum rate of basic compensation therefor.

"§ 4. *Restrictions on officers and employees as to interest in patents*

"Officers and employees of the Patent Office shall be incapable, during the period of their appointments and for three years thereafter, of applying for a patent or, during such period and for three years thereafter, being named as an inventor in an application for patent for an invention made during such period or for three years thereafter and of acquiring, directly or indirectly, except by inheritance or bequest, any patent or any right or interest in any patent, issued or to be issued by the Office. Such applications for patent thereafter shall not be entitled to any priority date earlier than three years after the termination of the appointment of such officers and employees.

"§ 5. *Administrative Law Judges*

"(a) There shall be in the Office not to exceed twenty-four Administrative Law Judges who shall be appointed under the competitive service, in the manner prescribed for Administrative Law Judges (5 U.S.C. 3105, 5362, 7521). The per annum rate of basic compensation of each Administrative Law Judge shall be fixed at not in excess of the maximum scheduled rate provided for positions in grade 17 of the General Schedule (5 U.S.C. 5104).

"(b) The Administrative Law Judges shall be persons of competent legal knowledge and scientific ability, who will perform and exercise the judicial functions of the Commission.

"(c) The Administrative Law Judges shall review all final orders (as that term is defined in 5 U.S.C. 551) of primary examiners and may review orders issued pursuant to section 23 of this title, except with respect to such matters relating to Commission procedure which the Commission has by general rule or regulation assigned for determination by an Administrative Law Judge, who shall from time to time be designated by the Administrative Law Judge senior in date of appointment. Except as otherwise provided in this title, the Commissioners and the Administrative Law Judges shall exercise all judicial functions, including all agency review or appeals, under this title. The order of the Commission shall constitute final agency action (as that term is defined in 5 U.S.C. 551) in all matters considered by it.

"(d) Each appeal or other action shall be heard or considered by an Administrative Law Judge, except as otherwise provided in subsection (c) of this section. Said Judge shall be designated for each case by the Judge senior in

date of appointment, consistent with the provisions of section 3105, of title 5, United States Code. The Commission has sole power to grant rehearings.

"(e) Whenever the Commission considers it necessary to maintain the work of the Administrative Law Judges current, he may designate any patent examiner of the primary examiner grade or higher having the requisite ability, to serve as an Administrative Law Judge for periods not exceeding six months each. Not more than one acting Administrative Law Judge shall be a member of any panel of two or more Administrative Law Judges hearing any appeal or considering any case. The Commission is authorized to fix the per annum rate of basic compensation of each designated Acting Administrative Law Judge at not in excess of the maximum scheduled rate provided for positions in grade 16 of the General Schedule (5 U.S.C. 5104). The per annum rate of basic compensation of each designated Acting Administrative Law Judge shall be adjusted, at the close of the period for which he was designated to act, to the per annum rate of basic compensation which he would have been receiving at the close of such period if such designation had not been made.

"§ 134. *Appeal to Administrative Law Judge*

"(a) The appeal from any final decision of the primary examiner shall be to an Administrative Law Judge. The Public Counsel shall be responsible for briefing and arguing the case before the Judge in respect to any appeal taken by any applicant, except in respect to priority of invention contests pursuant to section 136 of this chapter, in which case participation of the Public Counsel shall be at his discretion.

"(b) If any appeal is taken to an Administrative Law Judge, the primary examiner may, within such time as the Commission may by regulation prescribe, prepare a legal opinion elaborating and explaining the decision and statement made by him pursuant to section 132 of this chapter. The primary examiner shall not, in any appeal, otherwise appear before the Administrative Law Judge.

"(c) In any proceeding before an Administrative Law Judge, any party may introduce into the record any patents, publications, or other evidence of the state of the art not previously made part of the record: and may seek to reverse the decision of the primary examiner on the basis thereof. The Judge may consider the patentability of any claim in the application, de novo, or remand any proceeding to the primary examiner for reconsideration in the light of such or other further information, including any adduced by the Commission or the Judge, sua sponte.

"(d) Proceedings before the Commission and the Administrative Law Judges shall be open to the public and a transcript of any hearing shall be kept. The Judges shall render written decisions which shall be entered of record and govern further proceedings in the case. The decision of the Commission shall constitute final administrative action by the Office.

Mr. BROWNE. Also appended is a copy of a publication put out by the Patent Office, called *The Story of the United States Patent Office*, tracing the history from 1790 to 1970. That is the source from which I drew most of the historical data that I recited earlier, showing that throughout the greater part of history, the Patent Office has been an independent patent agency. The gist of my recommendation at this time is to put the Patent Office back where it was before it first came under the jurisdiction of the Department of Commerce.

[The document referred to may be found in the files of the committee.]

Mr. BROWNE. I make no comment at this time with respect to other sections of S. 1321, since other people and other organizations have addressed themselves to those subjects. My only message is a plea to stop making exceptions to provide for organization and administration of the Patent Office and bring it into line with the tried, proven, and familiar organization and administrative structures of independent agencies within the executive branch.

Thank you.

Senator HART. Thank you very much for giving us this historic flavor. And your argument, I think, is a very strong one.

Now, if I could assure you that the single point of your testimony—namely, that we treat the Patent Office consistently—I assure you the thrust of that will not be diluted in any respect if you go ahead now and give us your impressions about some of the other problems that we have been listening to here.

Do you have any strong feelings in any of those areas? And, with your background, I am sure you do.

Mr. BROWNE. Frankly, I did not intend to expound on any of the other points. But one of the things that has interested me, though, is the measure of productivity of the examiners in the administrative process. And I think that the explanation that was given by Mr. Dunne of the Patent Office Society has enlightened me considerably as I hope it has the committee. I do not think I could add much to what he has already said.

He works in the Patent Office, and I never did. So I think he speaks from not only more direct personal knowledge but more recent knowledge than most witnesses, even others in the profession, who may have worked in the Patent Office several years ago. I think that is an important factor.

As to how the examiners spend their time, if they spend 15 hours per application, what do they spend it on? I think this is something the committee needs to look into.

Now, going to deferred examination as a means of improving both the quality and the quantity of production—I have had considerable experience with filing applications abroad where deferred examination is available. Again, I support Mr. Dunne's statement that many times you file applications and request deferment of examination out of an abundance of caution, not knowing whether the invention is going to have sufficient industrial merit to warrant the examination costs involved. So I do think there is a tendency to file more applications where deferred examination possibility exists.

I think, by the same token, where we have rigid examination systems, as we have both in our country and in countries like Germany and Japan, it does give an applicant an opportunity to collect all the citations of art from various countries and evaluate whether it is worth the cost to obtain the patent here in the United States, where the cost of obtaining a patent in the first place is probably greater than in most other countries. Yet, in Germany, for example, the cost of maintaining the patent once you get it, through their maintenance fee structure the cost becomes horrendous as you get near the end of the term of the patent. So it costs the applicant a lot more to get the patent in the first place in the United States and nothing to keep it in force, whereas in Germany, it does not cost them quite as much to get it in the first place, but it costs them an awful lot of money to keep it in force.

So—the deferred examination system works well in Germany, in the sense that an applicant can defer the examination up to a point, but he still has to pay these maintenance taxes year in and year out. I believe in Germany it starts the second year after the application is filed—I am not sure; each country has its own regulations.

I think there are more disadvantages to the deferred examination system than there are advantages.

There is one point which I think has been overlooked in the testimony that I have heard so far; that is, the public interest aspect of the delay in bringing the patent into fruition as a consequence of the deferred examination system. Above all, I think most of the hearings have brought out that there is a strong desire, in the public interest, to bring about publication of the contents of patent applications at the earliest practicable date. In a deferred examination system, even if you provide for the publication of the contents, you still have not defined the scope of protection to which the patent will be entitled when and if it is ultimately examined and issued.

So, again, I think the committee may look with interest on the public aspect of the impact of the deferred examination system, rather than looking at it from a businessman's, attorney's, or Patent Office worker's attitude, and see what is the ultimate impact on the system.

Again, one of the things—on a different subject—I am glad to know that the committee, apparently—and the administration, both—seem to want to move forward on the patent bill, the patent reform, and hold aside the matter of the antitrust problem for separate treatment. We have waited all too long to find out what the new patent law is going to be. I certainly am pleased to hear that some progress may be made in the direction of reporting out the bill before the recess, and I hope that my suggestion will not have the effect of delaying it.

That is all I have.

Senator HART. Thank you.

Now, finally, on page 5 of your prepared testimony, you commented on the increasing tendency on the part of more recent Secretaries of Commerce and Assistant Secretaries to exercise greater policy and operational control and domination on the Commissioners of Patents. Do you have any specific examples?

Mr. BROWNE. I think I can speak from my own personal exposure to the situation. I would say, beginning at the time that Assistant Secretary Hollomon became the Assistant Secretary for Science and Technology, that marked, I think, a strong trend toward controlling the Patent Office policy and selection of the personnel to fill the jobs of the Commissioners and Assistant Commissioners. Maybe I should say I was flattered to be called upon by Assistant Secretary Hollomon and Dr. Eaton to give them my contributions and suggestions of names of people that might adequately fill the positions of Commissioner and Assistant Commissioners.

As I later learned in conferences in conjunction with the State Department, it seemed that there was more and more of the voice of the Assistant Secretary's Office being raised than that of the Patent Office, as an independent spokesman. In other words, you cannot sit there and express your independent views when the boss is sitting there along side of you—not that I can pinpoint any situation with Commissioner Brenner or any other Commissioner that I know of where he was muzzled or anything like that. Again, the human

factor is such that where you know that a party is in a position to indicate that it might be a good idea to submit your resignation to the President, you would not do much to cross him. This is my fear.

Senator HART. If he suggested to you that you move on a particular patent application?

Mr. BROWNE. I heard the testimony on this. I agree, Senator, that it would be absolutely inappropriate for the Secretary of Commerce, and I would go so far as to say the Commissioner of Patents, to direct an Examiner to take up a particular application and act on it out of turn. As far as the general categories, such as things to promote the environment, I think that is perfectly within the province of whoever has general supervisory control over the operation to give a broad direction. That is a matter of policy again.

Senator HART. Mr. Brennan?

Mr. BRENNAN. Mr. Browne, many students of government feel that multitember Commissions have been an administrative failure. They also tend to become the captives of certain interests.

Is there any reason to feel that there would be a more promising history with the type of Commission outlined in your proposal?

Mr. BROWNE. I would think not, in terms of potential captive members—from what I read in the papers these days of appointment of members to other regulatory commission, it appears that the consumer's voice is being heard like it has never been heard before as, opposed to the industrial interests. I won't say any one Commissioner or any one interest group might not be more persuasive than another. I think everyone has read the papers and knows that Congress is sensitive to the public interest and is giving a more earnest hearing to the public voice when it comes to appointment of members of a five-man Commission of which no more than three can be of one party than they do when a nomination comes up for a Commissioner of Patents or Assistant Commissioners who is three or four echelons deep in the Commerce Department. I do not think the public has had nearly as much to say about the selection of the people who are administering the patent system as they should have, even though I, individually, have been given the opportunity to suggest names.

Mr. BRENNAN. Would you not be adding to the administrative expense by providing a staff for each of the five members of the Commission?

Mr. BROWNE. Administratively within the Patent Office it would increase the cost, you say?

Mr. BRENNAN. The total operating budget, the superstructure for administrative purposes that would add appreciably to the operating expenses of the Patent Office.

Mr. BROWNE. No, I do not think so. On the contrary, it might conserve some of the expense, because right now we have a Commissioner provided by statute, a Deputy Assistant Commissioner who used to be called the First Assistant Commissioner, and two other Assistant Commissioners, most of whose time is devoted to administrative matters which maybe ought to be handled by other than Presidential appointees; that is, professional administrative person-

nel which they already have in terms of the management group and so on.

As far as the Board of Appeals is concerned, I notice the numbers here that you provide for Examiners-in-Chief in your S.1321—I would not change the numbers at all. I would save time and effort by, instead of having them sit on in panels of three, as the Board members do now, have them sit individually. They may have to spend a little bit more time in hearings and taking evidence than as Board members do collectively now, but you would have a better record; you would improve the quality of patents because in that way you would eliminate, by the way, the 196(b) type of rejection which, you recall, is applied if the Board has a new ground upon which to refuse the application, and sends it back to the Examiner for further examination. Under my proposal, once it is before the Administrative Law Judge, and he finds a new ground for rejection, he can deal with the applicant right at the time, on the spot, and dispose of it, instead of sending it back through the examining process.

Again, in the public interest—you would be defeating the public interest by delaying the issuance of the patent for another year or 2 if you allow the application to go back to the Examiner for further action. Whereas, if the Judge decides a patent should issue right then and there, I think he would effect savings in the overall operating costs, as well as improving the quality of the patents.

Mr. BRENNAN. Thank you.

Senator HART. Mr. Nash?

Mr. NASH. One point, Mr. Chairman. There is an excellent article by Robert C. Watson, titled "The Patent Office, Its Place in the Executive Branch." If there is no objection, it might be placed in the record.

Senator HART. So ordered.

[The material referred to follows:]

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THE PATENT OFFICE—ITS PLACE IN THE EXECUTIVE BRANCH

Robert C. Watson ¹

"But when the Patent Office shall have been moved into a building especially adapted to its needs, it is believed that every consideration of good administration and the building up and improvement of the office to the highest state of efficiency will demand that it be made in fact an independent bureau, subject to the supervision of the President where any supervision is necessary."

This sentence might well have appeared in a report issued today as the recommendation of any one of a considerable number of professional or industrial organizations familiar with the manner in which the Patent Office performs its statutory duties and with its needs. Instead it is taken from the 1912 Report of the "Presidents Commission on Economy and Efficiency" reported in House Document 1110 of December 9, 1912, (page 25). On the preceding page it is pointed out that, when the Patent Office is housed in the same building as that occupied by the Secretary of the Department of which it comprises a subordinate Bureau, its housekeeping needs are less likely to be met than they would be were it an independent bureau.

¹ Of Counsel, Watson, Cole, Grindle & Watson, Washington, D. C.

Now that the Patent Office is, in fact, in a building especially adapted to its needs, and the President has called upon the Congress to "reform" our basic Patent Law, it is highly advisable to give serious consideration to the 1912 recommendation of the then "Presidents Committee on Economy and Efficiency". Of course that recommendation did not stand alone, many generally similar recommendations having been made at earlier times by others. Also, since 1812, a number of serious and knowledgeable supporters of our Patent System have advocated independence for the Patent Office. This is indeed an appropriate time to consider past recommendations that this action be taken and to determine whether or not the circumstances which presently exist are such as to warrant serious efforts to achieve what our predecessors recommended but did not succeed in obtaining. It appears to the writer that all of those concerned, inventors, industry, bar associations, and individuals interested in good Government, should now become active to this end.

To make clear why it was that earlier supporters of independence for the Patent Office so recommended additional extracts from their writings will be presented. The 1912 report of the "Presidents Commission on Economy and Efficiency", also included, on Page 24, the following statement:

THE PATENT OFFICE AS AN INDEPENDENT BUREAU

"A question of very considerable importance in connection with the administration of the Patent Office is that relating to the administrative authorities superior to the Commissioner of Patents.

"The Patent Office has been a bureau of the Department of the Interior since the creation of that department in 1849, covering the entire period of the great activity of the office. The nature of the business committed to the Patent Office has no relation to other work carried on in the Department of the Interior nor, as a matter of fact, is there any particular connection between the work of the several bureaus in that department. There is no good reason why the Patent Office should be transferred from the Department of the Interior to any of the other executive departments. Its work is so independent of the other activities of the Government that it can be as well carried on under one department as another.

"The question has been raised many times as to the advisability of making the Patent Office an independent bureau."

In the year 1812, just 100 years prior to the statement of the Presidents Commission just above quoted, a House of Representatives Special Committee headed by Chairman Seybert, stated in its "Patent Office Investigation Report" (Page 221) that:

"At this period, the conduct of the Patent Office was called into question, and the inquiry which the above-mentioned committee conducted was intended by the House resolution to ascertain the number of employees, the state and condition of the office, and what, if any, fees had been demanded by the clerks, gross amount of fees received up to December 31, 1811, how expended, how accounted for, and amount of balance on hand. This information of course, was to be obtained from the Secretary of State and it is interesting to note that the members of the committee evidently appreciated a certain incongruity in the establishment of the Patent Office within the Department.

"Chairman Seybert ends his letter of inquiry to Monroe, their Secretary, with the suggestion that 'this occasion may enable you, by the proper representation, to separate the patent establishment from the Department of State and to afford you an opportunity to suggest an organization more proper than the present for the depot of models.'

"Monroe made answer that in debating the question whether the Patent Office should not be independent of all departments and responsible to the President he considered the objections must be given great weight. He disapproved the independent organization of the minor bureaus whose heads are not, and ought not to be, members of the administration. All such should be included under some department of the Government since 'concerns of such inferior departments can not be investigated and discussed with the same advantages in the meetings and deliberations of the administration as they might be if the person charged with them was present. *** To remedy this inconvenience the President would necessarily become the head of that department himself, and thus be drawn into much investigation, in detail, that would

take his attention from more general and important concerns to the prejudice of the public interest.' He considered the Patent Office was as properly a part of the State Department as it was of any other department. 1812—House of Representatives Special Committee headed by Chairman Seybert."

In the year 1912 a report entitled "Patent Office Investigation Report" was published and on page 231 the following statement appears:

"In 1849 came the creation of the Department of the Interior and under it was placed the Patent Office. As early as 1852 complaints were made by the commissioner that the Patent Office has no more logical connection with the department than it has with any other; that it suffers with all the inconveniences and embarrassments of such relation, but gains none of the advantages. This idea has continued until the present time. It is often recommended that the office be made an absolutely independent bureau, whose head shall be appointed for life."

On March 24, 1884 Senator Platt of Connecticut introduced a bill, S. 1924, "providing for the organization of the Patent Office into an independent department, and for giving it the exclusive control of the building known as the Patent Office and of the fund pertaining to that office." (Page 2408, Congressional Record—Senate March 31, 1884) and supported his proposal in a great speech the report of which covers 16 closely printed pages of the Congressional Record.

He recited in detail the history of the patent system from April 10, 1790, when it was established, up until the date of his talk, and it is appropriate to quote some of the passages of that speech which deal with the subject with which we are presently concerned. Early in his talk he said:

"The growth of our patent system, its vast importance, its intimate connection with and direct influence upon the property of the country demand that it shall receive a degree of attention which it can not and will not receive while it remains a merely subordinate bureau of the Interior Department."

and much later, after having devoted much time to praising the operation of the system as one of tremendous importance in promoting the national welfare and remarking that the passage of the Act of 1836, creating the Patent Office, introduced "the most important epoch in the history of our Government from the Constitution until the war of the rebellion", again stated his opinion in these words:

"I say that the Patent Office should be made an independent Department, not only because of the vast importance of the interests which it must care for, but because of the treatment which it has received and must continue to receive so long as it remains a subordinate branch of the Interior Department.

"If the Secretary of the Interior had as many heads as the Hindoo divinity Siva, and as many arms as Briareus, he could not personally perform all the duties pertaining to his office that would be most acceptably performed if he could give them personal attention."

In commenting upon the duties and salary of the Commissioner of Patents and the need to eliminate all control over the Commissioner by the Secretary of the Interior he said:

"Every year's experience adds greatly to the capacity and ability of the Commissioner of Patents. In a word the Patent Office needs and demands better administration, and it will never have it as a rule until it shall be made a separate Department. It must be held in entirely different estimation by Congress and by public sentiment before it will be what it ought to be. The way to secure this estimation by Congress, the way to secure for it what it wants and what it needs and what it must have if it is properly to discharge the high functions which devolve upon it, is to separate it entirely from any supervision by the Secretary of the Interior, to make it independent and dignified.

Third. It has been sadly neglected in the past. It must be enlarged and made more efficient, and this never will be as long as it remains simply a fifth-wheel of the Interior Department coach."

*** and in closing he commented upon certain of the arguments which had come to his attention, and which had been advanced by some who looked with disfavor upon his proposal, in the following terms:

"Let me close by noticing an argument that I have heard urged against this bill. I have heard it stated that the moment we get the Patent Office created

an independent department we shall be wanting to have its head a Cabinet officer. That demand will never come from me, Mr. President: and if I am here in my place in the Senate and it is ever made I will oppose it. There is no reason why the head of the Patent Office department should be a member of the Cabinet. The Cabinet is large enough already. It requires neither the Commissioner of Agriculture nor the Commissioner of Patents within it. They can not add to its value; they can not add to its strength. The Patent Department is not of a character which requires representation in the executive council; it exercises little influence on the administrative policy of the Government, very little more influence than do the courts. There is neither need nor propriety that the head of the department should be one of the President's constitutional advisers, and I venture to say that in the last twenty years no question has ever arisen in Cabinet council regarding the administration of the business of the Patent Office. I venture to say the Secretary of the Interior has not been called upon in Cabinet sessions in twenty years to express any opinion as to the management of that portion of his Department. With the other branches it is different; the railroads, the Indians, and the lands have much to do with the political management of our Government. The administration must have a policy with regard to the Indians, with regard to land grants and land-grant railroads, but as to patents it needs and should have no other policy than that so plainly expressed in the Constitution."

On April 16, 1912 Mr. Oldfield, Chairman of the Committee on Patents of the House of Representatives, introduced a bill identified as H.R. 23,417 which, if enacted into law, would have established the Patent Office as an Independent Agency. This was vigorously supported by the then Commissioner of Patents, Mr. Edward B. Moore, in both a letter dated April 10, addressed to Mr. Oldfield (by permission of the President) submitting a draft of that bill in the form in which he hoped it would be introduced, and in his Annual Report to the Congress. In his Annual Report Commissioner Moore said:

INDEPENDENT BUREAU DESIRABLE

"I have long been of the opinion that since the opinion of the Supreme Court in the Case of *Butterworth v. United States ex rel. Hoe and others* (112 U.S. 50), which made the decision of the commissioner final within the office, thus doing away with appeals to the Secretary of the Interior, the connection of the Patent Office with the department is so slight that it would seem that its separation and establishment as an independent bureau is eminently desirable. Such a step would not only place the Patent Office upon a more stable footing with regard to the exercise of the powers of the commissioner invested in him by law, but would relieve the department of the physical burden of caring for and appropriating for the bureau.

"I believe that the establishment of the Patent Office as an independent bureau would be a step in the direction of progress and that it is also in the interest of efficiency and economy. Its duties as an office are purely judicial in character with such incidental clerical work as is necessary to carry them out; it requires in its employees special training along scientific and legal lines, and such employees are difficult to obtain and to retain in service, except at salaries higher than those paid to the other employees of the department; and the Patent Office has always suffered by reason of the failure of Congress to make the provision necessary. If good results are to be obtained, everything possible should be done to insure the independence, efficiency, and permanence of tenure of the entire force of the Patent Office. The Patent Office has nothing in common with the other bureaus of the Interior Department or of any other department. There is no appeal to the Secretary of the Interior on any question relating to the grant of a patent, and all appointments to positions in the Patent Office, except such as are Presidential, are made upon the nomination of the Commissioner of Patents, approved by the Secretary. The desirability of this change in the status of the Patent Office is recognized and provided for in a bill introduced by Mr. Oldfield, chairman of the House Committee on Patents of the House of Representatives, on April 16, 1912, and known as H.R. 23417."

*** and in his letter to Mr. Oldfield he pointed out that:

"One of the most important things which, in my opinion should be accomplished is the establishment of the Patent Office as an independent bureau. As you are aware, patents were originally granted under the act of 1790 by a tribunal consisting of the Secretary of State, the Secretary of War, and the Attorney General, and patents granted by this board were signed by the President. From 1790 to 1802 the Patent Office was under the jurisdiction of the State Department, and the work was performed by a clerk of that department. In 1802 Dr. Thornton was appointed as superintendent of the Patent Office, and for 26 years exercised full control of its force. In 1836 the Patent Office was reorganized and made a bureau of the State Department its chief being given the designation of Commissioner of Patents. He was appointed by the President with the advice and consent of the Senate. Under the law of 1849 the Patent Office was transferred to the Interior Department, and has been a bureau thereof since that date. The Patent Office has nothing in common with any of the other bureaus of the Interior Department, and Mr. Secretary Fisher in his report to Congress for the fiscal year ending June 30, 1911, has indicated that, in his opinion, it is improperly made a part of the Interior Department. . . .

"It is difficult to see that there is such relationship between the work performed by the Patent Office and that performed by the Department of Commerce and Labor or any of its bureaus as would necessitate placing the Patent Office within the jurisdiction of the Secretary of Commerce and Labor. The function of the Patent Office is believed to be wholly distinct from any bureau of any department."

Commissioner Moore also was clearly of the belief that, in the event that a separate building for the Patent Office should be authorized, the Patent Office should be very definitely freed of its association with an executive department, saying:

"A measure has recently been presented to Congress authorizing the construction of a new Patent Office building as a companion building to the Library of Congress. It is believed that the Patent Office, like the Library of Congress, should be independent and directly under the control of Congress. This, in my opinion, would be in consonance with the spirit of the Constitution and Congress would have power to "Promote the progress of science and the useful arts" by securing to both authors and inventors the exclusive rights to their respective writings and discoveries. On this clause of the Constitution, so far as authors are concerned, Congress has provided the Library in which their writings may be suitably stored and supervised by an officer, independent of any department. It seems to me that likewise a Patent Office building should be provided and the Patent Office also made a separate institution responsible directly to Congress for the carrying out of the duties imposed upon it."

In 1919 a very considerable effort by a number of well advised supporters of the Patent system was made to establish the Patent Office as an independent bureau. The National Research Council submitted a report of favorable nature, a proposed bill, H.R. 5011 of June 5, 1919, resulted, and hearings were promptly conducted by the House Committee on Patents. That portion of the report of the National Research Council pertinent to the subject under discussion follows:

THE PATENT OFFICE A SEPARATE INSTITUTION AND INDEPENDENT OF THE
DEPARTMENT OF THE INTERIOR

"The second proposal which your committee recommends is that the Patent Office be made a separate institution, independent of the Interior or any other department.

"The Patent Office was originally in the State Department, but, on the formation of the Interior Department in 1849 it was made a bureau of that department and has been so ever since.

"The only matters connected with the Patent Office with which the Secretary of the Interior has anything to do are the following: The Secretary of the Interior must submit to Congress all estimates for appropriations. All appointments, excepting those of the commissioner, two assistant commission-

ers, and five examiners in chief, are made by the Secretary, but only on the recommendation of the commissioner. The eight places named are presidential appointments, but the Secretary makes recommendations to the President. All matters of disbarment or reinstatement after disbarment of attorneys are passed upon finally by the secretary. All matters of discipline are under the Secretary's jurisdiction. The Secretary of the Interior must approve all changes in the rules of practice of the Patent Office, but he can not compel the commissioner of patents to make any change whatsoever.

"No appeal lies to the Secretary from any decisions of the commissioner, either in matters of merit or practice. All such matters, as far as they are reviewable, rest with the courts of the District of Columbia.

"The Secretary of the Interior no longer signs the patents and has no jurisdiction to grant or refuse them.

"Thus it will be seen that the Secretary of the Interior is not required to know anything about patents or patent law. He is not selected because of any qualifications for the granting of patents or supervision over the Patent Office. The Secretary of the Interior has less influence over the Patent Office than over any other bureaus of the Interior Department, because there are appeals to him from all the other bureaus. Nor is the Patent Office related to any other bureau of the Interior Department.

"The Secretary of the Interior has recently moved out of the Patent Office Building, thus severing physical contact with the Patent Office, which is but a type of the lack of mental contact between the office of the Secretary of the Interior and the Patent Office.

"The experience of many commissioners over a period of several generations has shown that, no matter how pleasant the personal relations may be, the Commissioner of Patents can not expect any real benefit to the Patent Office to flow from its connections with the Interior Department. There is nothing in common between the interests of the Interior Department and those of the Patent Office and, consequently, nothing to produce any advantage from the amalgamation of the Patent Office into the Interior Department.

"Your committee believes that to make the Patent Office an independent bureau would greatly increase the respect of the public and Congress and the courts for it and would make it easier to procure enlarged appropriations and better salaries than under present conditions.

"As to appropriations, under present conditions the demands of the Patent Office for equipment, personnel, and salaries are necessarily subjected to comparison both by the Secretary of the Interior and by Congress with those of several other unrelated bureaus, each pressing its own demands and criticizing any apparent preference. In the opinion of your committee this operates as a severe handicap. In estimating the needs of the Patent Office, there should be no discussion of the demands, for example, of the Pension Office or the General Land Office. As an independent institution, the needs of the Patent Office would be judged on their necessity and the appropriation be determined by consideration of general policy.

"As to the personnel, the enhanced dignity and independence of the Patent Office would render all positions of importance in it more attractive, and particularly would make it easier to secure and retain in office men of the necessary qualifications to fill the difficult office of commissioner.

"A copy of a proposed bill for making the Patent Office an independent bureau is annexed to this report; and its enactment is recommended by your committee."

The testimony of witnesses who supported the bill was generally to the same effect.

For thirty-five years following the hearings of 1919, the subject of possible independence of the Patent Office seemed to have attracted little Congressional attention, no bills to implement this objective having been introduced and no hearings scheduled.

During this period however, the Patent Office, despite the determined resistance of the Patent bar, suffered a very severe set-back in that Reorganization Plan Number 5 became law. Because of this poorly conceived and thoroughly ill advised legislation the Commissioner's authority to decide Patent controversies, arising in the Patent Office, became vested in the Secretary of Commerce who, in effect, became Commissioner of Patents, the Presidentially appointed

Commissioner functioning in the performance of his duties only by delegation of authority from the Secretary. The passage of this law nullified the earlier decision of the Supreme Court in the Case of *Butterworth v. Hoe*, 112 U.S. 50, previously mentioned, which upheld the contention of the then Commissioner to be exclusively entitled to decide cases "in which, by law, he is appointed to exercise his discretion judicially."

At the hearings conducted by Senate and House Committee it was urged by witnesses that the Patent Office should be completely independent of the Department of Commerce although, strictly speaking, this was not the issue involved. All persons who have occupied the Commissioner's chair since the passage of this act have been handicapped to an extent which varied with the circumstances then existing and it is to be hoped that the occupant of this office may, in the near future, carry out his statutory duties without interference from the head of any Department.

In 1955 hearings were held by Subcommittee 5 of the House of Representatives Committee on the Judiciary and those who testified, urged that the Patent Office should be free of possible interference by a Cabinet Officer. In 1957 Senator O'Mahoney, for himself and Senator Wiley, introduced, on April 12th, Senate Bill S. 1862. The bill specifically provided that the Patent Office was to be established as an independent agency in the executive branch of the Government. It was not enacted into law. It was followed by S. 1389 on March 12, 1959, transmitted by Senators O'Mahoney and Wiley jointly, and having the same objective. It was not passed. Thus, today, we look back on a very lengthy series of important recommendations and efforts made by knowledgeable and earnest persons sincerely interested in the welfare of the patent system and especially the Patent Office, none of which bore fruit.

Included among those having knowledge of the manner in which the affairs of the Patent Office are conducted, and who support the proposal to establish the Patent Office as an independent agency, are persons who had served in that Office, including former Commissioners Ooms, Kingsland, Marzall and Watson, also former Assistant Commissioner Richard Spencer, the latter having been particularly interested in that he published a book in which his position on this subject was plainly stated. It was made clear at a 1957 meeting of the Section of Patent, Trademark and Copyright Law of the American Bar Association that former Commissioners Ooms and Marzall supported the independence proposal and Commissioners Kingsland and Watson have made their positions clear at other times and places. Former Commissioner Coe found it to be helpful, in order to obtain Presidential consent to several proposals, to have the then Secretary of Commerce present them on his behalf at meetings of the Cabinet, but in all other respects advocated independence. Assistant Commissioner Spencer devoted an entire chapter of his book "The United States Patent System with a Complete Program for its Improvement and Amplification", published in 1931, to the subject "The Patent Office as an Independent Bureau" and made reference to a number of earlier publications of interest to anyone studying this subject, some of which have not been specifically mentioned in the foregoing paragraphs. His experience had been such as to convince him that the Office should be established as an independent bureau.

Former Congressman Lanham in his October 1955 testimony before the Senate Committee on the Judiciary made it abundantly clear that he favored establishing the Patent Office as an independent agency, this being an expression of opinion which should be given great weight as Mr. Lanham had served 25 years on the Committee on Patents of the House of Representatives.

In the preceding paragraphs the opinions of some, but by no means all, of the persons who have advocated independence of the Patent Office have been mentioned and it is in order to get forth the views of the two large groups of lawyers whose special qualifications and expertise should give their opinions great weight, i.e. the American Patent Law Association and the Section of Patent Trademark and Copyright Law of the American Bar Association. Investigation disclosed the fact that the American Patent Law Association has so far expressed no opinion on the subject of Patent Office independence.

The Patent Section, on the other hand, has given the matter consideration and has, whenever it did express a positive opinion, disapproved the proposal. Thus, in 1957 (Summary of Proceedings, Page 46) a Section subcommittee

urged that the Section register its support for S. 1862, this being the bill to establish the Patent Office as an independent agency in the executive branch of the Government which had been introduced by Senator O'Mahoney for himself and Senator Wiley. The motion was voted down 32 to 19. The 14 line resume of the brief debate which took place is wholly insufficient to make clear why it was that the motion was lost and certainly fails to correctly summarize the comment of this writer; who supported the resolution. The adverse comments of only two persons are mentioned and only one soon reported comment is understandable, i.e. that if the Patent Office were independent the Commissioner would be forced "to enter the political area".

In 1949 (reported at Page 63 of the 1959 Summary of Proceedings) a resolution favoring the enactment of S. 1389; the second bill introduced by Senators O'Mahoney and Wiley and also proposing to establish the Patent Office as an independent agency was voted down 21 to 10. Those who spoke against the resolution seemed to be persuaded that, if the change were to be made, the Commissioner would be subjected to political pressures, no other reasons for disapproval being advanced. The recommendation of the Committee which presented and supported the resolution was signed by 36 Section members who were favorable and by 8 who disapproved. Thus the over-all vote would have been 46 for passage of the resolution favoring the bill and 29 for rejection had all members of the committee attended the meeting. It will be noted that the attendance at both the 1957 and 1959 Section meetings, as evidenced by the numbers voting on these two resolutions, was quite small in relationship to Section total membership.

The Committee report supporting the resolution presented in 1959 (page 28 of the Committee Reports) was well and thoughtfully prepared; listing a number of substantial reasons why the Patent Office would profit if it were made independent of Commerce and it listed a few which were offered in support of the adverse position. The supporting reasons were largely those which earlier writers had mentioned in the publications to which reference has already been made in this writing. The negative argument was apparently based on these generalities, i.e. (1) the Federal Government would be more efficient with fewer rather than more independent agencies and passage of special legislation of this type for the Patent Office would tend to create a "rash" of clamor for more independent agencies; (2) the Patent Office would lose cabinet representation if it became independent and (3) if made independent it might be included in an existing or a new department not as helpful to is as the Department of Commerce.

The reader must himself evaluate the potency of these arguments but to the writer they lack persuasiveness. Reasons (1) and (3) are based on pure speculation and the likelihood that either feared event, even if it actually occurred, might result disadvantageously to the Patent Office or to the public interest, is not demonstrated. In addition it is highly unlikely that the Patent Office, if made independent, would then be forced into a department other than the Commerce Department or, in other words, have its independence taken away from it. Reason (2) is in the writer's opinion without real substance. Patent Office affairs being dealt with by the Congress and not at meetings of the Cabinet.

When the resolution was being considered at the Section Meeting (1959 Summary of Proceedings 63) it was stated that independent agencies are subjected to political pressure to a greater extent than those attached to major Departments and that the Commissioner would necessarily be a politician. Where is the political pressure coming from? The writer knows of only one instance when pressure which might possibly be called political, was exerted upon a Commissioner (a predecessor in office) and this was applied by the then Secretary of Commerce. The Commissioner of Patents need only be "Political" to the extent that, when he appears before Congressional Committees, he can accurately describe the condition of affairs in the Patent Office, and explain its needs.

A resolution "approving in principle the establishment of the Patent Office as an independent agency" was presented for consideration at the 1963 meeting of the Section (1963 Committee Reports) but was recommitted without action having been taken (1963 Summary of Proceedings 47) and at the 1964 meeting a resolution was presented which called for committee study of "the advisabil-

ity of establishing the U.S. Patent Office as an independent agency of Government including both Patent and Trademark activities."

RELATIONSHIP OF THE PATENT OFFICE TO OTHER BUREAUS OF THE DEPARTMENT OF COMMERCE

From what has already been said it is clear that many who have had first hand knowledge of the nature of the organization of the Patent Office, the statutory functions which it performs, and the character of its personnel, have concluded that there is little resemblance between it and the other Bureaus of the Department of Commerce. In fact the Patent Office is different in its makeup, statutory authority and performance from any other Bureau which is attached to any other Department of Government. It more closely resembles in its functions, several of the Independent Agencies or Regulatory Commissions than it does any other non-independent bureau. It is hardly necessary to explain how it differs from The National Bureau of Standards, the Weather Bureau, the Coast and Geodetic Survey, The Bureau of Public Roads, the Office of Technical Services and the Maritime Administration, those other Bureaus for so long a time in the past having functioned so publicly in the performance of tasks so vastly different from those which the Patent Office undertakes and accomplishes. As a matter of fact there is just one small area in which the concern of the Patent Office is the same as those of Standards, Maritime, Weather, Public Roads and Coast and Geodetic and this relates to the storage and retrieval of technical information, the Patent Office having a relatively small unit charged with the duty of developing ways and means for mechanically accomplishing the ever increasing labor of determining novelty of invention by searching the prior art. The Patent Office and the Bureau of Standards have worked closely together in attempting to solve the many problems involved in efforts to utilize the computer in this work. Other than in this area, however, there is no identity of specific direction of effort by the Patent Office and the other Bureaus of the Department of Commerce.

In spite of these circumstances, however, an officer of the Department, having a rank below that of the Secretary but superior to that of the Commissioner of Patents, has had vested in him the right to approve or disapprove " * * * regulations established by the Commissioner of Patents in accordance with Section 6 of Title 35 of the United States Code for the conduct of proceedings in the Patent Office."

Thus, the Secretary of Commerce made effective, as of July 30, 1962, the following order:

ASSISTANT SECRETARY OF COMMERCE FOR SCIENCE AND TECHNOLOGY

Delegation Relating to Certain Patent Matters

"Pursuant to Authority of Reorganization Plan No. 5 of 1950, 64 Stat. 1263, as amended, there is hereby delegated to the Assistant Secretary of Commerce for Science and Technology, and he is authorized to perform the following functions:

"A. The approval of regulations established by the Commissioner of Patents in accordance with Section 6 of Title 35 of the United States Code for the conduct of proceedings in the Patent Office.

"B. The certification in accordance with Section 266 of Title 35 of the United States Code of the use or likely use in the public interest of an invention for which a patent is being applied.

Effective date: July 30, 1962.

LUTHER H. HODGES,
Secretary of Commerce."

Section 6 of Title 35 of the United States Code is as follows:

PAR. 6, DUTIES OF COMMISSIONER

"The Commissioner, under the direction of the Secretary of Commerce, shall superintend or perform all duties required by law respecting the granting and issuing of patents and the registration of trademarks; and he shall have charge of property belonging to the Patent Office. He may subject to the approval of the Secretary of Commerce, establish regulations, not inconsistent with law, for the conduct of proceedings in the Patent Office."

July 19, 1952, C. 950, Par. 1, 66 Stat. 793.

"As a result of this grant of authority to one of the politically appointed higher ranking officers of the Commerce Department of certain of the prerogatives of the Commissioner of Patents, under the authority of that ill considered and destructive document known as Reorganization Plan Number 5, the Assistant Secretary of Commerce for Science and Technology has become the immediate superior of the Commissioner insofar as "regulations" are concerned, the Secretary, of course, retaining the right to control other activities of the Commissioner. The Secretary or his appointee could, if he so chose, decide individual cases which arise in the Patent Office since Reorganization Plan Number 5 reads, in part, as follows:

"SECTION 1. Transfer of functions to the Secretary (a) Except as otherwise provided in subsection (b) of this section, there are hereby transferred to the Secretary of Commerce all functions of all other officers of the Department of Commerce and all functions of all agencies and employees of such Department. (b) This section shall not apply to the functions vested by the Administrative Procedure Act (60 Stat. 237) in hearing examiners employed by the Department of Commerce, not to the functions of the Civil Aeronautics Board, of the Inland Waterways Corporation, or of the Advisory Board of the Inland Waterways Corporation."

"SECTION 2. Performance of functions of Secretary. The Secretary of Commerce may from time to time make such provisions as he shall deem appropriate authorizing the performance by any other officer, or by an agency or employee of the Department of Commerce of any function of the Secretary, including any function transferred to the Secretary by the provisions of the reorganization plan."

Reorganization Plan No. 5, purported to implement the recommendations of "The Commission on Organization of the Executive Branch of the Government" of which Herbert Hoover was Chairman, and was established by Public Law 109 of the 81st Congress. This Commission submitted 19 reports to the Congress, of which one was primarily concerned with the organization of the Department of Commerce. A few lines only were devoted to the Patent Office and its problems and no attempt was made to demonstrate that this office should remain in Commerce. That seems to have been taken for granted.

One of the reports of this Commission is entitled "The Independent Regulatory Commissions" and its opening paragraph reads as follows:

"The independent regulatory commission is a comparatively new feature of the Federal Government. It consists of a board or commission, not within an executive department and engaged in the regulation of some form of private activity. In this report, the Commission on Organization had confined itself to a discussion of the organization problems of the agencies, and does not deal with their quasi-judicial or quasi-legislative functions."

Federal Power Commission.

Interstate Commerce Commission.

Federal Power Commission.

Federal Trade Commission.

U.S. Maritime Commission.

Securities & Exchange Commission.

Federal Communications Commission.

Civil Aeronautics Board.

National Labor Relations Board.

These agencies, the commission stated, regulated:

" * * * private activity in such significant fields as labor; transportation, whether by rail, truck, pipeline, ship or airplane; credit; banking; securities both on or off the stock exchanges; trade practices; communications including radio, television, telegraph and telephone; the developments, sale and distribution of electric power together with the financing of these and other enterprises."

In subsequent sentences the Commission added:

"The Commissions were created not only to provide for the orderly dispatch of complicated controversies by bodies deemed expert in their respective fields, but also to eliminate abuses that had crept in and, at the same time, to promote an adequate and healthy development of the activities subject to their control.

"To achieve adjudication of controversies the Commissions were freed of the necessity of following the niceties of court procedures, and their decisions were final, with only limited review by the courts."

In its "Concluding Report" the Commission made no specific reference to the position of the Patent Office and its place in the Executive branch of government although, in a chart which forms part of that report, the Patent Office is shown as one of ten bureaus of the Department of Commerce grouped together under the general heading "Industrial and Commercial Service."

The term "regulatory commission", strictly speaking, does not best describe the Patent Office, but it does perform quasi-judicial functions and certainly "regulates" the activities of those inventors who seek patents, and their backers. A straight and narrow path must be followed by the protection seeker from which deviation is not permitted, and this may be fairly called "regulation". But even if the Patent Office cannot be so described, its right to independence is not prejudiced: good management in the Executive Branch warranting its elevation to this rank. Now that the Congress is being asked to consider the patent "Reform" bill of the present Administration together with many other bills relating to the Patent Office and system which have been introduced by various important members of the Congress, a favorable opportunity has been presented. Even if complete liberation cannot be effected immediately, a favorable atmosphere for a later effort may be created. It may also be demonstrated, if an opportunity is provided, that the authority of the Assistant Secretary for Science and Technology to control the activities of the Commissioner is quite limited under the present order. Of course, the Secretary can enlarge this Assistant Secretary's authority if he chooses to do so but such a move would be in defiance of the reasoning which resulted in the creation of the office of Assistant Secretary for Science and Technology in the first instance. It will probably be appropriate to give some account of the administrative move which resulted in the creation of this position on the Commerce staff.

At the request of the then Secretary of Commerce, the Hon. Sinclair Weeks, the National Academy of Sciences appointed a committee to evaluate the functions and operations of the Department of Commerce, the objectives being stated as follows:

"The National Academy of Sciences will establish an ad hoc committee of eminent scientists and engineers to evaluate the functions and operations of the Department of Commerce to insure that it is fulfilling its responsibilities in the interest of science and technological progress. The activity of said committee shall include, but is not restricted to, a study of all major elements (1) of the needs of science and industry for services of the type the Department should provide, (2) of new or improved means to enable the Department to effectively meet these needs, and (3) of improved methods of relating the Department's program on a continuing basis to dominant and changing needs of science and industry. The findings and recommendations of the ad hoc committee will be incorporated in a final report to the Secretary of Commerce."

The Committee appointed transmitted a 10-page report from which two paragraphs are copied, as follows:

"The scientific and technical areas that Standards, Patents, Weather, Maritime, Roads, Coast and Geodetic and Technical Services encompass are indeed wide, with little overlap or interplay. The operations of all areas, however, have much in common. They are the operations that scientists and engineers employ in creating new scientific and technical knowledge and applying it; and in evaluating, interpreting, and judging scientific and technical information. In carrying out the operations of these widely different areas, laboratory and office space and technical facilities are required. They differ in kind and in amount from one area to another, but have a commonness in that all provide the environment and the tools for creative scientists and engineers."

It is clear that the ad hoc committee of scientists was thinking of science and technology and not of legal decisions, court reviews and patent systems generally, both here and throughout the world. And yet it was the Assistant Secretary for Science and Technology who addressed committees of both House and Senate in support of the Administration bill for the Reform of the patent system and improved relations with other patent issuing countries. He argued at length against retention of our "interference" practice and advo-

cated the adoption of a substitute procedure-basic patent law subjects which are hardly related to the subject of "science and technology" or to the consideration of "regulations" suggested by the Commissioner. What was his experience in this legal area? Was he acting within his grant of authority?

It is unprofitable, however, to argue this point since it is abundantly clear that the Secretary can delegate, because of the authority vested in him by Reorganization Plan Par. 5, to anybody below him in the Department of Commerce, all or any portion of the authority vested in the Commissioner of Patents by Section 6 of the Title 35 of the U.S. Code. This is not likely to happen to a really serious extent but it may happen and, if the Assistant Secretary was acting within the scope of authority granted him when he testified recently it has happened. Reform is desirable. The Commissioner is the one to discuss with the Congress the legal functions and needs of the Patent Office, and to propose plans for international cooperation in both patent and trademark matters rather than persons not legally trained with less knowledge of and experience with patents, although of higher rank.

One Secretary of Commerce, the Hon. Sinclair Weeks, was more than willing to restore to the Commissioner of Patents the exclusive right to perform, without interference from above, his statutory duties although he was unwilling to support a proposal that the Patent Office be made an independent agency. Thus, he supported before the Bureau of the Budget a proposed bill to be submitted to the Congress which read, in part, as follows:

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that Section 3 of Title 35 of the United States code is amended by adding at the end thereof the following: "The Secretary of Commerce may authorize only the Commissioner of Patents to superintend or perform all duties required by law respecting the granting and issuing of patents and the registration of trademarks. Performance of the functions of examining applications for patent by officers and employees of the Patent Office, of considering appeals under Section 134 of this Title by the Board of Appeals, and of adjudicating questions of priority under Section 135 of this Title by the Board of Patent Interferences, shall not be reviewable by or subject to the control of the Secretary of Commerce. Likewise, the functions of passing upon applications for registration of trademarks, service marks, collective marks, and certification marks, and renewals thereof, applications for registration on the supplemental register provided by Section 1091 of Title 15, trademark opposition, cancellation, interference and concurrent use proceedings, and appeals under Section 1070 of Title 15, shall not be reviewable by or subject to the control of the Secretary of Commerce."

This proposed legislation was definitely intended to recognize by statute the authority of the Commissioner to perform without interference by the Secretary, those duties which all Commissioners had customarily and legally performed prior to the enactment of Reorganization Plan No. 5 in 1950. However, when presented to the Bureau of the Budget for endorsement at a hearing attended by the Secretary and the Commissioner, which was necessary, that Bureau held that, if it aided the Patent Office in this manner, it would be forced to act in favor of all other similarly situated bureaus of the Executive Branch and that would be too great a burden. So the effort failed although the reasoning of the Bureau of the Budget was far from persuasive, there being wide differences between the functions performed by the Patent Office and those of all other bureaus.

It may be asked, and no doubt will be asked if a bill proposing to establish the Patent Office as an independent agency should reach the Congress, how the Patent Office cost of operation will be affected by such a move, and whether or not its "housekeeping" capabilities may be affected. A careful study of these possibilities made some years ago, when S. 1862 (Senator O'Mahoney's bill) was pending, indicated that of the various functions performed by officers and employees of the Patent Office by far the greater number would not be rendered more difficult or expensive to perform in the event that the personnel and facilities of the Department of Commerce were no longer available, and that many functions could be performed more easily at less cost by an independent Patent Office. In fact, it was then found that one additional function only would of necessity be performed were the Patent Office to be separated from Commerce, i.e., it would be necessary to designate one or more employees

to make purchases, by contract, of supplies from industrial concerns. Much duplication of paperwork would be eliminated if the Patent Office could act independently of Commerce, and, generally speaking, it is believed that the well-staffed Patent Office could, now that it is in its own building, operate more efficiently and at less cost, in a housekeeping sense, than it will be able to do if it continues to act through employees of the Department of Commerce.

The office of the Secretary of Commerce may be, and often is, occupied by several persons successively during the period of service of one Commissioner of Patents and, during the same time interval, a succession of persons may occupy each of the subordinate offices, the several positions of Assistant Secretary and that of General Counsel. Rarely do these Presidential appointees have more than superficial knowledge of the manner in which the Patent Office carries out its statutory duties but, as already made clear, at least one is given supervisory authority with respect to the Patent Office and is thus in position to disapprove constructive proposals of the Commissioner if, in his judgment, they should not be implemented. All possibility of such interference should be eliminated and, when the Congress has approved a plan of procedure proposed by the Commissioner, he should be allowed to carry it out without Departmental interference.

Actually, the slowly changing committees of Congress, the Appropriation and Judiciary Committees of House and Senate, with their permanent staffs and sometimes with agency scrutinizing special assistants, are in better position to evaluate the merits of proposals developed by the Commissioner of Patents than are the more rapidly shifting persons who occupy executive positions in the Commerce Department.

The question may be asked—why has not the Congress, which has created the nine Regulatory Agencies with their quasi-judicial and quasi-legislative functions and given them a measure of freedom from executive supervision, not similarly acted in the case of the Patent Office? In all probability its long history of service as a bureau of a Department of the Executive Branch, first in State, then in Interior and now in Commerce, in each of which it performed well, has not stimulated the concept that it could better its statutory functions if it were made independent of departmental regulation.

The Congress passed the legislation which created the Patent Office in 1836 and has since modified, from time to time, the statutes which control its operations as well as appropriating, year by year, the funds which it must have in order to function. The Congress is well aware of its great value to the nation and of the fact that it is manned by competent, diligent, personnel, makes its own rules, selects those who wish to practice before it, disciplines those who fail to adhere to its regulations, constantly endeavors without pressure from any superior authority to improve its techniques of examination and its administration and, in summary, is an unusually experienced body well able to manage its own affairs administratively, under Congressional supervision, and render appropriate decisions in individual cases, subject to adequate court review. It does not, in the writer's opinion, need Cabinet representation, in fact there is no information tending to show that it has within recent years been given Cabinet consideration except when Commissioner Coe was in office, as has been previously mentioned.

Summarizing briefly:

1. As early as the year 1812, it was suggested by a Congressional Committee that the "Patent establishment" might well be separated from the Department of State and as late as 1959, a bill to establish the Patent Office as an Independent Agency was placed before the Senate. Between these dates, from time to time, other bills to the same effect were introduced and many individuals well acquainted with the manner in which the patent system functions and the Patent Office performs its statutory tasks have expressed the belief that it should be made independent of any Executive Department.

2. No knowledgeable group has expressed a contrary opinion except the section of Patent Trademark and Copyright Law of the American Bar Association which, in 1957, voted its disapproval of the Bill, S. 1862, introduced by Senator O'Mahoney, and which, if it had become law, would have had the effect of establishing the Patent Office as an independent bureau.

3. The American Patent Law Association has not advocated either independence of the Patent Office or its continuance as a Bureau of the Department of Commerce.

4. If the Patent Office were to be established as an independent bureau, its cost of operation would not be increased—perhaps decreased.

5. If established as an independent agency, the Patent Office would not have representation at meetings of the President's Cabinet, but no important, long-lasting advantage is known to have been realized in past years because of such representation. Its presentations to the Committees of Congress might well be more satisfactorily accomplished.

Senator HART. Mr. Browne, thank you very much for an interesting and helpful testimony.

Mr. BROWNE. Thank you very much.

Senator HART. We adjourn to resume in this hearing room on Friday of this week at 10 a.m.

[Whereupon, at 3:25 p.m., the subcommittee was recessed to reconvene at 10 a.m., Friday, September 14, 1973.]



**S. 1321—FOR THE GENERAL REFORM OF THE PATENT
LAWS, TITLE 35 OF THE UNITED STATES CODE. AND
FOR OTHER PURPOSES**

FRIDAY, SEPTEMBER 14, 1973

**U.S. SENATE,
SUBCOMMITTEE ON PATENTS, TRADEMARKS, AND COPYRIGHTS
OF THE COMMITTEE ON THE JUDICIARY,
Washington, D.C.**

The committee met, pursuant to recess, at 9:10 a.m., in room 1114, Dirksen Senate Office Building, Senator Philip A. Hart presiding.

Present: Senator Hart (presiding).

Also present: Thomas C. Brennan, chief counsel; and Dennis Unkovic, assistant counsel, Subcommittee on Patents, Trademarks and Copyrights; Bernard Nash, assistant counsel, Anti-Trust Subcommittee.

Senator HART. The committee will be in order.

Mr. BRENNAN. Mr. Chairman, the first witnesses this morning appear on behalf of the American Chemical Society.

Senator HART. President Nixon, would you identify yourself?

**STATEMENT OF DR. ALAN C. NIXON, PRESIDENT, AMERICAN
CHEMICAL SOCIETY; ACCOMPANIED BY: DR. ROBERT W. CAIRNS,
EXECUTIVE DIRECTOR, DR. JOHN T. MAYNARD, CHAIRMAN OF
THE SOCIETY'S COMMITTEE ON PATENT MATTERS AND RELATED
LEGISLATION, AND DR. STEPHEN T. QUIGLEY, DIRECTOR OF THE
DEPARTMENT OF CHEMISTRY AND PUBLIC AFFAIRS**

Dr. NIXON. My name is Alan C. Nixon. I am president of the American Chemical Society for 1973, and with the authorization of its board of directors, I appear before you today to present the Society's statement. Accompanying me today are Dr. Robert W. Cairns, executive director; Dr. John T. Maynard, chairman of the Society's Committee on Patent Matters and Related Legislation; and Dr. Stephen T. Quigley, director of the Department of Chemistry and Public Affairs.

We appreciate being given this opportunity to comment on certain features of The Patent Reform Act of 1973, S. 1321. The issues addressed by this legislation are both fundamental to the formulation of national science policy and of vital significance with respect to the ability of our nation to resolve many of the problems which confront it. These issues have been under discussion for some time now by the committee on patent matters and related legislation of

the board of directors and Council of the American Chemical Society, and a consensus on them has been under development. The viewpoint which we attempt to express is that of the chemical scientific and technological community, as represented by the American Chemical Society.

The American Chemical Society was founded in 1876 and chartered by an act of Congress in 1937 as a nonprofit, scientific and educational organization. Our current membership numbers approximately 109,000 individual chemists and chemical engineers. This membership reflects a broad spectrum of engagement in academic, governmental, and industrial professional pursuits. About 70 percent of our members are employed by industry, about 20 percent employed by academic institutions, and 10 percent by Government and nonprofit institutions. Under its national charter the society is charged with the responsibility to work for the advancement, in the broadest and most liberal manner, of chemistry, "thereby fostering the public welfare and education, aiding the development of our country's industries, and adding to the material prosperity and happiness of our people." Also, the charter imposes an obligation on the society to provide assistance to the Government in matters of national concern related to its area of competence. Its Federal incorporation replaced a New York State charter which had been effective since November 9, 1877. We are now almost 100 years old. As a matter of fact, we will celebrate our centennial as the country celebrates the bicentennial.

One of the principal objects of the society, as set forth in its charter, is the dissemination of chemical knowledge through its publications program. That program now includes 20 journals, largely scholarly journals that contain reports of original research in the many specialized aspects of the practice of chemistry, as well as a weekly newsmagazine designed to keep chemists and chemical engineers abreast of the latest developments affecting their science and related industries. In addition, the society is the publisher of Chemical Abstracts, one of the world's most comprehensive abstracting and indexing services.

As is indicated by the objectives of the American Chemical Society, we believe that the effective dissemination of scientific and technical information is critical to the development, not only of the society and economy of the United States but also of modern society worldwide. In addition to the journal literature, patents are an important instrument for the dissemination of scientific and technical information. Unlike the chemical field with its many extensive journals program, there are many technical fields in which the published patent is the only source, or almost the only source, of technical information. And even in the field of chemistry, technical information in certain areas of major commercial importance is available only in the patent art for the first several years after the initial discoveries are made. As our technology continues to become more complex, we believe, that a strong patent system is a vital source of technical information and a major stimulus to creativity and invention. The incentives to enter the patent system need to be sustained

and strengthened if the technological preeminence of the United States is to be maintained.

We are here today to discuss the position of the American Chemical Society on certain major changes in the patent laws of the United States that are embodied in S. 1321. Senator McClellan has asked for comment on five aspects of S. 1321; (a) Provision of adversary hearings in the examination process; (b) creation of the Office of Public Counsel; (c) a system of deferred examination of patent applications; (d) a maintenance fee system; and (e) the establishment of the Patent Office as an independent agency.

We agree that these are important aspects of S. 1321, and we plan to restrict our specific discussion today to these matters.

We recognize, however, that there are many other controversial aspects of S. 1321, some of which we would favor and some of which we would oppose. For reasons which will become clear from our comments, we hope that the implementation of the major revisions of our patent statutes under consideration today will not be delayed indefinitely by indecision over the other points of S. 1321. Six years have elapsed since the report of the President's Commission on the Patent System, and we believe it is urgent that these matters be resolved if confidence in our patent system is to be maintained. The American Chemical Society stands ready to advise the Congress on any aspects of S. 1321 beyond those being considered at these hearings, or on other legislative initiatives related to the patent system that would affect the practice of chemistry.

The American Chemical Society shares the concern that has been expressed by many participants in our patent system over the high proportion of patents that are held invalid when litigated in the courts. A frequently mentioned proportion of litigated patents held invalid is 70 to 80 percent. It is obvious that many patents of doubtful merit are being granted by the U.S. Patent Office. We take note, however, of the finding by Professor Irving Kayton of the George Washington University National Law Center that, when the courts consider no prior art other than that known to the Patent Office during examination of the patent application, 75 percent of litigated patents are upheld. While different conclusions may be drawn from this striking fact, we prefer to take it at face value. If the Patent Office had the manpower and resources to bring the totality of existing art into consideration during examination, we would expect that the great majority of issued patents could withstand challenge in the courts, and confidence in the patent system would be improved immeasurably.

Recognizing these facts, the American Chemical Society believes that certain of the changes in our patent statutes proposed in S. 1321 have merit, and I would like to discuss in some detail our position on the major points suggested for consideration by Senator McClellan. Our position in some respects represents a change from that presented to this committee in February 1968 when Dr. Cairns commented on the report of the President's Commission on the Patent System and on the legislative proposals under consideration at that time. These changes in viewpoint have been influenced both by the problems with the issuance of U.S. patents already mentioned

and by 5 years' further experience with new approaches that have been introduced in the patent systems of some of the other major countries of the world. We think it is time to give serious thought to modifying our patent procedures.

First, let me discuss the proposal to adopt a deferred examination system. Such a procedure is now used by several important countries, including the Netherlands, Germany, and Japan. In spite of early trepidation and predictions of disaster for this procedure, we think it is fair to say that the results of deferred examination have been good. As anticipated weak patent applications and those of minor commercial merit have been abandoned without the cost or effort of examination. The fund of public knowledge has thus been increased, and most importantly, the examining corps of the countries involved have been able to expand their efforts on careful scrutiny of those applications for which examination is requested.

We favor a deferred examination system, but hasten to add that we have reservations about certain details of the proposals of S. 1321 in this regard. S. 1321 proposes at paragraph 122 (a) that patent applications be laid open to public inspection at an early, unspecified time "before the date of first examination." In the case of applications for which examination has not been requested, that is, those deferred, we recommend strongly that they be published 18 months after the priority date assigned the application but with the proviso that the applicant have the right to withdraw his application from the Patent Office up to that time if he wishes. This procedure is used by other countries with deferred examination systems and seems eminently reasonable and fair to us. The applicant has a limited option of foregoing patent protection if circumstances change from the time he files his application, and he has 18 months to do the development and market research necessary to define the true scope and value of his invention. Chemical technology is a complex and time consuming art, and we regard 18 months as a minimum reasonable time for evaluating a new discovery.

Turning now to the broader question of whether some form of adversary proceeding should be incorporated in the patent examining process, the American Chemical Society believes that in principle this would be a desirable change from the present *ex parte* examination. We favor the adoption of new procedures that would have the effect of insuring as nearly as possible that all known prior art is considered by the Patent Office before a patent is granted, for the reasons given above. However, we have serious reservations about the specific provisions of S. 1321 for achieving this result. We believe the powers given in paragraph 3(d) to an Assistant Commissioner to be known as the "Public Counsel" are so sweeping that more mischief than good might be expected from such an officer. We believe that the same result could be achieved more economically and with greater assurance of success by some form of opposition proceeding based on information submitted to the Patent Office by interested third parties. We do not favor the exact procedure in S. 1321 insofar as it provides that the third party may participate in the reexamination process as defined in paragraph 135(d). The reason we have this reservation is our experience with the frequent

use in other countries of the world of such opposition procedures to harass applicants and delay issuance of patents. I think that would be particularly true in the case of single inventors and so forth. However, we do favor the provisions of paragraph 135(a-c) which provide for the submission by third parties of prior art not cited by the examiner as the result of his search, followed by examination of the application by the Patent Office on the basis of this art. We are satisfied that this procedure without additional provisions would go far to insure the issuance of U.S. patents that would stand up in the courts.

In Senator McClellan's announcement of these hearings, he also asked for comment on the proposal in S. 1321 that a system of maintenance fees be established for U.S. patents. We believe that this would be desirable, both to provide a measure of financial support for the operations of the Patent Office and to accelerate the process of moving technology into the public domain. However, the specific sums mentioned in S. 1321, that is, \$1,000 per annum with a 25 percent escalation each year, seem exorbitant to the point of being confiscatory, and we urge that a more modest scale be adopted. We are favorably impressed by the provision that maintenance fees may be deferred or waived in the case of individual inventors or small companies and would hope that equitable procedures can be accepted along these lines.

Lastly, comment was requested on the proposal to give the Patent Office the status of an independent agency. The American Chemical Society maintains its long-standing conviction that a strong patent system has been a major factor in encouraging the outstanding success we as a Nation have achieved in science and technology. The stability of the Patent Office appears to have been weakened to some degree in recent years by frequent changes in its leadership and by apparent disagreements between departments of the administration on patent policies. We believe that a strong Patent Office dedicated to firm, impartial implementation of the patent statutes is of vital importance to the health of our technologically based economy. We favor the proposal to make the Patent Office an independent agency to give it freedom from any undue political considerations. This should enhance the respect we all have for this excellent and important organization.

To summarize, the American Chemical Society favors changes in the patent statutes that can be expected to strengthen our patent system and lead to the issuance of carefully examined patents capable of standing up in the courts and earning the respect of all. As the leading scientific and technological Nation in the world, our patent system deserves no less.

Thank you.

Senator HART. Mr. Nixon, thank you very much. I hope you would express to the society the feeling of the subcommittee that the balance and fairness of this testimony is noteworthy. I recall the position the society took in 1968.

Dr. NIXON. 1968?

Senator HART. And the changes that are reflected in your position now. I think you identified as principal reasons for the change the

opportunity to evaluate new methods of what has been developed in other major industrial countries, plus the continued unsatisfactory or relative unsatisfactory quality of the work product of the Patent Office.

We are grateful that you and your associates would do what politicians are very reluctant to do, and that is to ever admit that they could take a new look at anything.

Dr. NIXON. Thank you.

Senator HART. Having said that, and inasmuch as we have asked each spokesman for an organization who has testified to identify their membership and the way the position they have taken is developed, and to what extent their position has been reviewed, would you describe your committee?

Dr. NIXON. It is a continuing committee, so that they are continually looking at legislation that is proposed, not only this legislation but for instance the Moss bill and other bills. This is a very important function, we feel, of the society, to be sure that our members understand the effect of legislation which is proposed and try to make sure that it serves all of the community in the best manner.

Senator HART. Well, your society's membership is very broad?

Dr. NIXON. Right.

Senator HART. Would it be possible for you to provide for our record the names and affiliations of your Board members?

Dr. NIXON. Oh yes.

Senator HART. And would that also be possible with respect to the membership of the committee you mentioned, the Committee on Patent Matters and Related Legislation?

Dr. NIXON. Yes.

Senator HART. And now on page 4—and I read this not in the nature of a question but to underscore it.

It is obvious that many patents of doubtful merit are being granted by the United States Patent Office. We take note, however, of the finding by Professor Irving Kayton of the George Washington University National Law Center, that, when the courts considered no prior art other than that known to the Patent Office during examination of the patent application, 75% of litigated patents are upheld. While different conclusions may be drawn from this striking fact, we prefer to take it at face value.

And, parenthetically, I do too.

If the Patent Office had the manpower and resources to bring the totality of existing art into consideration during examination, we would expect that the great majority of issued patents could withstand challenge in the courts, and confidence in the patent system would be improved immeasurably.

Now, I would paraphrase that this way. If all of the relevant facts are before a Patent Office Examiner and he has a reasonable time to consider them, he will come up with the correct answer?

Dr. NIXON. Yes, I think that is correct.

Senator HART. That really is what we mean when we talk about an effort at patent reform.

Dr. NIXON. Yes.

Senator HART. That is really what we mean. That is really the focus and the basic purpose of the legislative effort reflected in Senator McClellan's hearings here.

You do comment on Patent Office fees. For our record, would you give us your reaction to a system of nominal filing and issue fees?

Dr. NIXON. Well, I think we are in favor of that, that is of those sort of fees, Senator. We are not questioning that at all.

Senator HART. Well let me give you the four elements and ask your reaction which we would like. It may make it easier and more understandable if we have that in the record: a system of nominal filing and issue fees; maintenance fees, every 3 years, starting in the fifth year at a rate decided by the Patent Office Commissioner designed to recoup the 65 to 75 percent of the Patent Office costs; with power vested in the Commissioner to grant special exemptions to individuals and small businessmen and so on. Now, have you any feeling as to that matter?

Dr. NIXON. Well, just offhand, Senator, it sounds like a better proposal than what is here present. The foreign countries do have a maintenance fee system but they are much more modest than what is proposed here, which would total something over \$100,000 for a complete patent that ran through to exhaustion. And the general principle we support is that the government try to recover a substantial proportion of the Patent Office costs, Senator.

Senator HART. Mr. Brennan?

Mr. BRENNAN. No questions.

Senator HART. Mr. Nash?

Mr. NASH. No questions.

Senator HART. Doctor, before you leave, do any of your colleagues care to make any comments or give any further remarks?

Dr. NIXON. Well, they are very modest people, but they might be persuaded to.

Dr. CAIRNS. The only thing I might say, since I have testified here before relative to the prior legislation, Senator, of course the bill was quite different when we testified in 1968 so naturally our comments and our views would be differentiable. And this general comment here, Senator, did not indicate too significant a reversal except perhaps on the question of deferred examination. We are still very anxious to see a high quality job done and to support the Patent Office in any way that we can.

Senator HART. Thank you, Doctor. It was indeed the position on deferred examination that I had particularly in mind when I made the comment.

Gentlemen, thank you very much.

Dr. NIXON. Thank you.

[The material requested earlier appears as follows:]

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Senator HART. Mr. Brennan.

Mr. BRENNAN. The next witness is Mr. Stanley Clark.

Senator HART. Mr. Clark, would you identify yourself for the record?

STATEMENT OF STANLEY M. CLARK

MR. CLARK. My name is Stanley Clark and I am presently Patent Counsel for the Firestone Tire and Rubber Co., but I am expressing my own personal views here. I am not speaking for the company.

SENATOR HART. I assume you wish to have your statement printed in full in the record?

MR. CLARK. Yes. I have submitted that statement and would like it to be printed in full in the record.

SENATOR HART. It will be at the appropriate place.

MR. CLARK. I had occasion to testify 2 years ago in connection with the proposed Anti-Trust and Licensing Provisions known as the Scott Amendments and in the course of my testimony I had a colloquy with Senator McClellan in response to a question that he had asked and that question has come up here repeatedly; namely, why there seems to be a different standard of invention between the courts and the Patent Office and why are 70 percent or so of the patents declared invalid when they reach the courts. If I may, Senator, I would like to read just a portion of that colloquy from pages 325 and 326 of my testimony. It won't take very long and I apologize for reading it.

MR. CLARK. *** The inventor, more particularly his patent counsel, has the time and the opportunity and the incentive far beyond the overworked patent examiner does not have; and when you add all this together it is an unfair struggle and this is why I would lend support to the Department of Justice position that the oath of the inventor ought to be restored to the proposed patent bill and that the burden should be upon the applicant to be fully candid with the Patent Office.

SENATOR McCLELLAN. You think the law does not require that now?

MR. CLARK. I don't think it does now, no, sir.

SENATOR McCLELLAN. If it is intended to it has a lot of loopholes in it, is that correct?

MR. CLARK. That is correct. I would suggest that the burden also be placed not only upon the inventor but upon the lawyer that is representing him. At present the burden is only upon the inventor.

SENATOR McCLELLAN. Why upon the lawyer?

MR. CLARK. Because often the lawyer knows more about the prior art and is the only contact with the Patent Office. Once the inventor signs an oath, which he doesn't understand, to a patent application which he usually can't interpret, then he is through with the whole procedure and you never hear from him again.

SENATOR McCLELLAN. But if the applicant testifies or signs a false oath knowing it is false, maybe his attorney doesn't know that.

MR. CLARK. That may be true. That may be true.

SENATOR McCLELLAN. I don't think the attorney should be held responsible for that.

MR. CLARK. No; but I think perhaps the attorney ought to be required on his own to make a full statement of the prior art as he knows it to the Patent Office.

SENATOR McCLELLAN. In other words, you would put a burden on the attorney not to rely upon the information supplied him by his client?

MR. CLARK. I would say if that is the only information he has he is entitled to rely upon it, but if an attorney has additional information, which he often has, sometimes these attorneys are as expert as the inventors in the art and as knowledgeable as the inventor in the art, he should disclose that information to the Patent Office.

SENATOR McCLELLAN. If he has additional information maybe he should rely on it or shouldn't, I don't know. But I wonder how far we are going and I am

not arguing against it at the moment, I am just trying to clarify what you are recommending with respect to placing an additional burden upon attorneys. Attorneys should not be permitted to permit fraud or to mislead, willfully mislead the court or in this instance the Patent Office, but I know that attorneys are often misled by their clients and how much a burden you put upon them or you are attempting to put upon them, they have to check the veracity and reliability of their own clients. Would you go that much farther now?

Mr. CLARK. I am not suggesting that. I am saying he is entitled to rely upon what his client tells him. I suggest if he has additional information he should volunteer it himself.

Senator McCLELLAN. Yes; if he has additional information and the client has not submitted it he shouldn't withhold that from the Patent Office.

Mr. CLARK. That is correct.

Senator McCLELLAN. That is what you are saying?

Mr. CLARK. Yes.

Senator McCLELLAN. I think that is not unreasonable at all. It might be proper.

Now the reason why I bring that before the Senators this morning is because several questions have been asked, all of which bear upon what I was suggesting 2 years ago and that is that the burden of the Patent Office will be lightened and the effectiveness of the Patent Office will be markedly improved if there is a fair and candid communication between the Patent Office and the applicants and the applicants' attorneys. I think that is in the public interest because stronger and better patents will issue and there will be fewer of them, I hope, declared invalid by the courts.

Let me say that this bill, S. 1321 seems to be marked by a more express concern for the public interest and to a far greater extent than our present patent law and for that matter than any other patent bill which I have ever seen presented.

I would like to refer to some of those provisions, which are present in 1321, which are in the public interest and I would like to speak a few words in support of them. In doing so I would like to answer some of the questions which have come up in the hearings in the last day or 2. To repeat, Senator, what I would like to say is that the applicant has the duty to be fully candid with the Patent Office, and, if he discharges that duty, then the burden on the Patent Office, will, in great part, also be relieved. An examiner will have more time and better patents will issue. And again, all of this is in the public interest.

Let us look at some of these mechanisms which are in 1321 which require and encourage that duty of responsibility and candor to be discharged by the applicant. First of all, I would like to refer to section 115 which provides that there be an oath by the applicant and by the attorney and by the agents acting on behalf of the applicant to lay before the Patent Office the prior art of which they are aware. Well, this is not a new view or a view peculiar to me. In the American Patent Law Association Bulletin for October of 1972, Mr. Rabinow—and I hope that is pronounced properly—he is a successful independent inventor—in that bulletin he made this statement and I quote him: "I think that the patent attorney should tell—and so on, and so on, in other words, he should help the Patent Office, and he shouldn't play games."

I will skip a little bit of what he says but he concludes by saying

We always felt we should tell them—he is referring to the Patent Office—everything we know and in saying what the prior art was, you should say what it really was because, if you don't do it you are really cheating the Patent Office.

That brings me to a second point in S.1321, which is the patentability brief. I highly support that provision. I think Mr. Rabinow's words, which I just quoted, which say that you should not play games with the Patent Office, that you should tell them what you think the invention is and why it distinguishes over the prior art in my opinion is recommending a patentability brief, for such a brief enables this function of candid communication with the Patent Office to be performed. It will not be performed absent such a brief: well, let me say it this way, it has not been performed fully in the past by applicants.

In that same "American Patent Law Association Bulletin," Mr. Dunner—and I believe I am pronouncing his name correctly—said and I will quote from page 635 of that bulletin:

I think there should be an explicit rule which requires an attorney at some appropriate stage in the application, certainly well ahead of the allowance, to file a written statement of the best public prior art he knows of.

Again that seems to me to be in support of the principle of the attorney's oath and of patentability brief.

There is one other point which may be a minor point and hasn't been brought up here and this appears in section 112 which prescribes the form of patent claim which is to be used, a form which the American Patent lawyers call a Jepson form of claim and which really follows the German form of claim prescribed by the laws of Germany. I think everybody agrees that Germany has a very good patent system.

Again in the bulletin of the American Patent Law Association for November-December of 1932, page 76, there is a quote, and I do quote.

A good many of the holdings that patents are invalid stem from the discovery on the part of a district judge that the invention which the Examiner thought was a substantial forward step was in fact the tiniest little pipsqueak of change from a product that had been in public use for years and which the Examiner had no way of learning about.

Now that is true: and, if you do not have a proper form of claim, it is often very difficult for the courts to determine what the inventive step was because that "little pipsqueak sort of change" is buried in a mass of obscure words, in very long and very difficult language. And that is the reason why I support the Jepson form of claim which is prescribed by section 112 of this bill, because if you have that form of claim and if the applicant has been candid with the Patent Office, that claim would have read in this manner. The claim would have read as follows:

- (1) In a product that has been in public use for years,
- (2) the improvement which consists of:
- (3) just the tiniest little pipsqueak sort of change.

If we insisted upon this form of claim, which to some may seem to be not too important, but which I think is very valuable; if we have this sort of claim presented to the examiner, it would lighten his burden because first of all he would direct his attention immediately to the final portion of the claim to see whether this "tiniest little pipsqueak change"—if that is what it was—really amounted to invention and it would expedite his search of the prior art and would expedite his consideration of the application. It might do it to a very material degree. On the other hand, if the last portion of the claim was not in fact "a little pipsqueak change" but was a substantial invention, its clear delineation in a Jepson claim would still help the examiner because it would expedite his search and his evaluation of the invention.

Furthermore, the patentability brief should bear directly upon that portion of the claim which comprises the invention, which comprises the forward step in the art and I assure you there are many claims that have been litigated that do not do that at all and you have to search through the language of the claim and find, if you can, what the invention is and pick it out from the prior art. I think it is most important that a patent claim be in such form that the examiner and the public and the courts will be able to understand it easily and completely.

I might also add that if the claims of a patent were in such Jepson form, and if that patent later reached the courts in a patent litigation, the court would be able to understand almost immediately just what the invention was all about. This again, is a provision which expedites the exercise of candor with the Patent Office. You are telling the examiner first by the attorney's oath and by the investor's oath that you are giving him all of the prior art of which you have knowledge; and in this form of claim you are stating precisely what your invention is; and with your patentability brief you are stating why it should be allowed.

There is one other section of S.1321 I wish to comment on: that is the examination provision in which the Patent Office, for the first time, is told explicitly to put down in the record the reasons why a patent is allowed. It is a very disturbing and infuriating experience to read the file history of a patent to find that the examiner has repeatedly rejected the claims and then suddenly you find there was an interview and without any further explanation the patent was allowed. It is allowed without any explanation of why the Patent Office changed its position after repeatedly rejecting the claims. I heartily recommend that the examination procedures of S.1321 be adopted.

Let me turn to the question of deferred examination and early publication. I approve both of those provisions without reservation. Early publication performs the function of the patent law, to inform the public, and the earlier the public is informed as to the advances in the art, the better it is for the public. As to the 6-month waiting period which is provided, I think such 6-month period is reasonable. Let me state that most corporations today keep a close watch of the foreign patents and usually within 2 years of the filing of U.S. Patent application a foreign patent issues or is made avail-

able for inspection—I am talking now about in France, South Africa, or Australia—sometimes it takes 2½ years. It used to take about 15 or 18 months. We then know which of our competitors have filed what sort of patent applications in this country. It would be cheaper and better and quicker if we could ascertain the same information by this provision for early publication.

So far as deferred examination is concerned, I am in favor of it for two reasons—first of all, many patents are filed as a protective measure, as shields. We are concerned about whether somebody else may at a later time take out a patent on one of our own developments and so we file a patent application only for the purpose of protecting ourselves against a patent suit brought by someone else who later on makes the same improvement. If we were to file an application and it were to be published within 6 months, then we would be sure that 1 year later or 18 months later that no one else could file a patent application covering that same subject matter and obtain a valid patent.

Other patent applications are filed originally in the hope and expectation that they represent a real advance in the art, but after a year or 2 of further experience we find that we were mistaken. Now if there were a deferred examination, we would probably allow those applications to lapse by failure to request an examination.

In both of those instances, deferred examination would save the Patent Office the problem of examining applications in which applicants really have no interest and I am sure there are many thousands of such applications filed each year. This result would give the Patent Office more time to turn their attention and their examining time to those applications in which the public and the parties are really interested. So I urge that there be early publication and deferred examination which will save the parties' time and will save the Patent Office's time. In that way the public interest will be served.

There are many things I would like to talk about but at this time I would rather answer some questions.

Oh, I have one point which I want to speak to also. It came up yesterday. It was a question of whether we should have "patent" courts. Senator Hart stated that he preferred "generalists" and I heartily second that opinion. I think it would be a great mistake to have specialized patent courts to determine patent matters. The present Federal courts are capable of doing the job provided there is adequate advocacy by counsel for both sides. I think that a Federal judge can handle the technical problems of patent litigation just as well as he can, for example, handle the medical problems that come up before him in personal injury litigation or the complex problems involved in SEC litigation. The legal and technical problems in patent cases are not overwhelming and I cannot conceive of a specialized patent court that could do as good a job as our present courts. Furthermore, I think that a specialized patent court system would eventually create its own little world without access to the public and I would much rather have Federal judges throughout this country handle the patent laws; and develop the application of the patent laws in the interest of the public than to have an ingrown

specialized patent court that would begin to believe that they were dealing only with their own little world.

Now I will be glad to answer any questions if there are any.

Senator HART. Well, Mr. Clark, your prepared testimony that we did have an opportunity to read supplemented by your oral testimony this morning is so comprehensive that I think we are left with very little to ask. There is no obscurity with respect to your views as to at least the principle elements of the bill. For all of that we are grateful. I know that in the earlier record of this committee on the occasion that you testified, I believe in 1970 or 1971, this item is reflected, but let me for the benefit of this record ask you the name of the company whose chief patent counsel you have served as for these many years?

Mr. CLARK. I am, and have been counsel for 14 years, with Firestone Rubber Co.

Senator HART. What kind of track record does Firestone have in the Patent Office and in patent litigation in the courts?

Mr. CLARK. Firestone has over the years been involved in almost every major piece of litigation involving the tire industry. There is one case that has not yet been finally decided, but in all other cases, Senator, we have resisted the major patents which we thought were invalid and at great cost and expense substantiated that position and won those cases. We have not filed patent applications—no, pardon me, patent suits against the tire industry based upon our own patents. I would say that our competitors would say that the Firestone Tire & Rubber Co. is antipatent. I do not believe it is. We are anti-invalid patents. And strongly so.

Senator HART. One of the points you have developed in your prepared testimony, and you referred to it again in your oral testimony, was the desirability of section 115's oath provision. Mr. Kauper, speaking for the administration or at least appearing on behalf of the Department of Justice and commenting on the bill, suggested that the administration bill does not include the attorney's oath. I asked this question just to underscore for the record your position. What is your view with respect to that?

Mr. CLARK. I see no problem with the attorney's oath. I am in favor of it. There has been a bugaboo raised that this puts too great a burden upon the attorney but in any oath the affiant need only testify as to what he knows and if he has no information as to a particular point, he can always state that fact. But I think that as to what an attorney knows which is relevant, he should state that and be willing to state it under oath or at least under conditions that would call for penalties if he deliberately misled the Patent Office.

The question has been raised that perhaps every application that is filed must have a search and that the attorney must make an exhaustive search before he can make such an oath. I don't think that is required. I think all he has to state is that we have made no search or we have made a small search, but in any event here is the prior art and the best prior art that we know of.

We have been doing this at Firestone for some years, because I feel and my management feels that an invalid patent is a debit and not a credit on the books of a company and it is a great mistake to

believe that you have an asset of some value when in fact you have an invalid patent, which could in the end become a very dangerous instrument to be turned against you.

I might add that insofar as an adversary proceeding in the Patent Office is concerned, Senator, there has for some years been an informal adversary proceeding. Let's assume that a corporation finds an issued French patent, which indicates XYZ corporation has filed a U.S. application, and they get a copy of that U.S. application from the French Patent Office. This is a normal, routine, proper procedure; and assume they are concerned about XYZ's patent application. They can take up a bundle of relevant prior art and submit it to the division of the Patent Office that is handling that subject matter and show them that issued French patent and say that if there is a U.S. application pending, and we are not asking you to state whether there is or not, but if there is one, then here is what we think is good, relevant, prior art.

Now sometimes that works and sometimes it doesn't. There are some patent lawyers that will not submit prior art to the Patent Office saying they would rather reserve it for later use in court. They say let the patent issue and then we will fight it in the courts using this prior art. The reason they do this is because they have more faith in the courts in applying the prior art than they have in the patent examiner to apply it properly. So the formal adversary system that is provided for in this bill will work to the extent the patent bar cooperates with it and to the extent the patent bar has an increasing confidence in the competence of the Patent Office and the willingness of the Patent Office to apply prior art properly. If they do not gain that faith, then they will hold the prior art back and wait for their day in court. That is why it is important in the administration of this bill that the adversary system be administered with great care in the Patent Office and that the Patent Office take steps to see to it that the prior art is properly applied; otherwise people will feel that they have "wasted" their prior art, in the Patent Office. However, I think the adversary system that is provided for by this bill could be very useful and I am in favor of it.

Senator HART. You have endorsed the deferred examination system. Now, as I understand the criticism or the opposition to deferred examination, and taking your view as being responsible for Firestone patents, the argument goes that you should be worried about your competitors filing a large number of spurious applications and deferring examination. As I understand it, the argument goes that this would create sort of a cloud over the technology because you wouldn't know which patents will issue. Firestone would be fearful of entering that area. Additionally, as I understand the argument, you would have to start reviewing all of the patent applications of your competitors in the art and the art would be burdened with a large number of questionable applications to be reviewed. How do you feel about that?

Mr. CLARK. I don't agree with that. I would in the first place much rather know what my competition has filed and have an opportunity to examine it and be sure of what is going on. We do find out as I said earlier, we generally find out from an examination

of foreign patents what may be in the Patent Office. However if the patent files should be made open to the public under 1321 we will know with certainty what is there. If there is an application, a patent application of interest, we will do one of several things. We will compile our prior art and our defenses to be ready if the patent issues. Or we could use those in an adversary proceeding in the Patent Office and block that patent. Or we would begin work to work around it, which is very often possible, and in fact sometimes works to our advantage. I do not think that a published application in which the examination is deferred would intimidate anybody from doing work in the same field.

As a matter of fact it might inspire them to beat their competitor at their own game; and I have seen that happen. So I think that it is all to the good to have the applications published earlier and to have a deferred examination.

Senator HART. Mr. Brennan?

Mr. BRENNAN. No questions.

Senator HART. Mr. Nash?

Mr. NASH. No questions.

Senator HART. Thank you. I read two sentences from your prepared testimony that struck my eye and that was "My view of the Patent System is that it is a system in distress, that it is in need of reform and that unless it is reformed it may face total collapse. Hopefully the provisions of 1321 will supply the needed reform."

Measured against your own background and experience, that caution I hope will persuade the committee and the Congress to move.

Mr. CLARK. I hope so.

Senator HART. Thank you.

[The statement of Stanley M. Clark in full follows.]

STATEMENT OF STANLEY M. CLARK ADVOCATING ENACTMENT OF S. 1321

This statement is generally in support of enactment of S. 1321 and I respectfully request that this statement be filed as part of the record in the Hearings held in connection with the proposed legislation.

The statement is an expression of my personal views and does not necessarily reflect those of my employer; it is based upon my experience and training as summarized below.

I am a registered Professional Engineer and have been a member of the Bar of the State of Ohio for 27 years and have been admitted to practice before the United States Patent Office for almost that period of time. My practice has generally been limited to the practice of patent law, including five years with a private law firm in Cleveland, Ohio, and the last 23 years in the Patent Law Department of an industrial company. I have been Chief Patent Counsel of this company for the past 14 years. During the course of these years, I have had extensive experience in the licensing of patents and in patent litigation, both in the United States and in foreign countries.

I have a deep interest in the patent system; I believe in the patent system, and I have an earnest hope and desire that our patent system will be improved to accommodate itself to a radically changed and changing world.

My view of the patent system is that it is a system in distress, that it is in need of reform and that unless it is reformed it may face total collapse. Hopefully, the provisions of 1321 will supply the needed reform. At least it incorporates many remedial features which are long overdue.

For these basic reasons, I favor enactment of S. 1321.

I will comment in detail upon a few of the many features which I favor and which I believe under the circumstances should be retained in the bill.

However, before I do that, I would like to take exception to three provisions of the bill; namely, Sections 263 and 273, and a portion of Section 112.

Section 263. Rights of employee-inventors guaranteed

Section 263 is, in my opinion, ill advised, mischievous and almost impossible to administer. It will breed discord and litigation. And I believe there are grave doubts as to its constitutionality.

It should be realized that an invention or a development, by the time it reaches commercial practice, is the result of the contributions of a great many individuals, the relative contributions of which are almost impossible to evaluate.

Many individuals make vitally important contributions which lead to the final commercial success of an invention that it will be literally impossible to determine just how much of the profit or savings can be "attributed" to the patent. The section should be deleted. Its effect would, in my opinion, lead to inequitable and unjustified consequences.

Section 273. Unauthorized practice of subject matter prior to issuance of patent

Section 273 provides for what I call "interim infringement". This is objectionable because it places the public in a position of uncertainty. There is no reason why the public should face the risk of infringing a patent whose claims are not yet certain and which may never be allowed.

The section apparently has been inserted in the bill as a partial remedy for the shortened term of the patent from 17 to 12 years. It would be far better to delete Section 273 in its entirety and in lieu thereof reinstate the term of a patent to the present 17 years.

Section 112. Specification

Paragraph (a) of this Section requires a specification to include "all knowledge known to the inventor and applicant necessary or commercially requisite to make, use and work the same."

This is burdensome, impractical and probably cannot be complied with. I urge that it be deleted.

COMMENTS IN SUPPORT OF S. 1321

Having stated my criticisms of the sections of the bill to which I strongly object, I would like to devote my remarks to those sections which I strongly favor. On balance, S. 1321 is desirable, long overdue and should be enacted. It will protect the public interest, strengthen the patent system and effect its constitutional purpose of advancing the arts.

First of all, the bill has several provisions which require the patentee and his counsel to play fair with the Patent Office and I favor all of these provisions.

Section 3 (d) Public Counsel

The concept of a Public Counsel having the power to intervene in the public interest, I believe, was suggested in the "Report of the President's Commission on the Patent System." As I understand it, the Public Counsel's role will be in the nature of an ombudsman and, hopefully, the Public Counsel would be able to perform such duties effectively. I should point out that the Public Counsel and his staff should be recruited at least in part from the patent litigation bar and in part from corporate patent counsel as well as from the public generally. Furthermore, there should be free and open communication between the Public Counsel and the patent bar and, of course, the public as well. To the extent the lines of communication are difficult or bogged down in bureaucratic red tape, then the Public Counsel will not only lose the confidence of the bar but will be denied its cooperation, and the Public Counsel will need such free and voluntary cooperation in order to function as effectively as he should.

Section 41. Patent Office fees

Section 41 (b) (1) has a concept stated as follows:

"Fees shall be designed to effect an overall recovery in the range of 65 to 75 percentum of the costs of operation of the Patent Office."

If the patent system serves its purpose, which is to inform the public of advances in the arts, then it seems undesirable to have a formal Congressional expression that the Patent Office shall be 65 to 75% self-supporting. Such an expression does not take into account the value of the information supplied to the public by patents.

However, I see no objection to moderate maintenance fees because they would serve a useful purpose in weeding out patents which sometimes lurk in the background for years until an industry has been built up and which are then, to the surprise of the industry, asserted in "strike suits".

The waiver of fees by the Commissioner is not set out in such clear terms as to protect an individual inventor or a small company to whom maintenance fees would be a burden. I would suggest that any individual person or corporation be allowed to designate each year five patents as to which maintenance fees would automatically be waived.

Section 102. Conditions for patentability; novelty and bars to patent

First, I endorse heartily the enlarged definition of prior art to include knowledge, public use and sale in a foreign country as being a proper recognition of the fact that the world is so much smaller in practical terms than it was more than 100 years ago when the present limited concept of "prior art" was adopted. It is easier to travel from New York to London today than it was to go from Philadelphia to New York a century ago. It is easier to learn what is going on commercially and technically in London or in Tokyo than it was 100 years ago for an inventor in Erie, Pennsylvania, to know what was occurring in New York City.

Furthermore, American corporations have direct commercial contacts in most foreign countries. For example, the annual reports of four of the large tire companies, namely, Firestone, Goodyear, General Tire and B. F. Goodrich, show these companies, collectively, to have some 99 subsidiaries, affiliated companies, or companies having technical service agreements with them in at least 54 different foreign countries as shown in the attached table, which is attached hereto as Exhibit A. How can it be argued that these companies and others like them have no knowledge of what is going on in the rest of the world.

Furthermore, the language of 102 which brings foreign public uses and sales into the prior art places an American inventor on more equal footing with his foreign competitors. Over 25% of the patent applications are filed by foreign nationals and these applications are likely to be of significant technological importance. It is grossly unfair for a foreign competitor to have a product successfully tested in the market place in Europe, and (as long as a description is not published) be free to file a patent application in this country and escape having his own prior public use in his homeland being applied against him as prior art. A United States citizen has no such freedom to follow the same course of conduct in the United States.

The second change in Section 102 which I approve is in connection with prior art which formerly was to be in "printed" form. In view of some courts giving a limited interpretation to the term "printed" the addition of the words "other tangible form" in defining prior art should enable all courts to hold that prior art includes, for example, typewritten descriptions, handwritten descriptions, blueprints, sketches, mimeograph copies, Xerox copies, photographic copies, including microfilms, computer storage systems, and the like.

Section 112. Specification

Paragraph (d) of Section 112 provides for a "Jepson" form of claim, a form of claim which I have advocated for many years. However, the preamble "where the nature of the case admits" should be deleted. It gives applicants and the Patent Office too much leeway in avoiding the mandate of this Section. I submit that a claim having the prescribed form can be drafted for any invention regardless of its nature.

The prescribed form of claim is most useful and desirable because it will give little opportunity for the nature and extent of the invention to be obfuscated either in the Patent Office or in the courts should the patent become involved in litigation. The form of claim should be mandatory and not left to the discretion of the Patent Office which has had more than 100 years to require such a claim and has failed to do so.

A Jepson claim follows the German practice of claiming and consists essentially of two parts in which the first part of the claim states what is old and the final portion sets out what is new. Let us see how this works. At Page 636 of the APLA Bulletin for November-December 1972, Mr. Dunner stated in connection with the disposition of courts to hold patents invalid, the following:

" *** at the very least, the examiner should have the benefit of the most relevant prior art of the published type that the applicant's attorney knows about."

" *** a good many of the holdings that patents are invalid stem from the discovery on the part of a district judge that the invention which the examiner thought was a substantial forward step was in fact just the tiniest little pipsqueak sort of change from a product that had been in public use for years and which the examiner had no way of learning about."

I agree wholeheartedly with the above remarks and would like to expand upon the last quotation. If a Jepson claim had been required in the cases referred to by Mr. Dunner, it would have read as follows:

"(1) In a product that has been in public use for years,

"(2) the improvement which consists of:

"(3) just the tiniest little pipsqueak sort of change."

If the Patent Office required a claim in this form, it would have been apparent to the patent examiner just what a "pipsqueak" the invention really was; the prosecution of the application would have been expedited and in all probability no patent would have issued. Even if the Patent Office had resolved doubts in favor of the applicant and had issued such a patent, then a claim in such form would have made the scope of the invention readily apparent to the court and it would have been able to dispose of the litigation with a minimum of expense and cost. Furthermore, in all likelihood, the court would justifiably hold that the "little pipsqueak of an invention" did not merit the protection of a patent.

However, perhaps an added proviso should be included to the effect that if an applicant deliberately includes old and conventional elements in Part 3 of the claim, such inclusion would make the claim invalid.

Section 115. Oath of invention

For example, Section 115 requires each agent, attorney or other person who participated in the preparation or prosecution of the application to file a statement which requires him to be fully candid with the Patent Office. Such a provision was discussed in the hearings before this Subcommittee in connection with S. 643, S. 1253 and S. 1255 in 1971. I refer particularly to pages 325 and 326 of those Hearings which read, in part, as follows:

"Mr. CLARK. * * * The inventor, more particularly his patent counsel, has the time and the opportunity and the incentive far beyond the overworked patent examiner does not have; and when you add all this together it is an unfair struggle and this is why I would lend support to the Department of Justice position that the oath of the inventor ought to be restored to the proposed patent bill and that the burden should be upon the applicant to be fully candid with the Patent Office.

"Senator McCLELLAN. You think the law does not require that now?

"Mr. CLARK. I don't think it does now, no, sir.

"Senator McCLELLAN. If it is intended to it has a lot of loopholes in it; is that correct?

"Mr. CLARK. That is correct. I would suggest that the burden also be placed not only upon the inventor but upon the lawyer that is representing him. At present the burden is only upon the inventor.

"Senator McCLELLAN. Why upon the lawyer?

"Mr. CLARK. Because often the lawyer knows more about the prior art and is the only contact with the Patent Office. Once the inventor signs an oath, which he doesn't understand, to a patent application which he usually can't interpret, then he is through with the whole procedure and you never hear from him again.

"Senator McCLELLAN. But if the applicant testifies or signs a false oath knowing it is false, maybe his attorney doesn't know that.

"Mr. CLARK. That may be true. That may be true.

"Senator McCLELLAN. I don't think the attorney should be held responsible for that.

"Mr. CLARK. No; but I think perhaps the attorney ought to be required on his own to make a full statement of the prior art as he knows it to the Patent Office.

"Senator McCLELLAN. In other words, you would put a burden on the attorney not to rely upon the information supplied him by his client?

"Mr. CLARK. I would say if that is the only information he has he is entitled to rely upon it, but if an attorney has additional information, which he often has, sometimes these attorneys are as expert as the inventors in the art and as knowledgeable as the inventor in the art, he should disclose that information to the Patent Office.

"Senator McCLELLAN. If he has additional information maybe he should rely on it or shouldn't, I don't know. But I wonder how far we are going and I am not arguing against it at the moment, I am just trying to clarify what you are recommending with respect to placing an additional burden upon attorneys. Attorneys should not be permitted to permit fraud or to mislead, willfully mislead the court or in this instance the Patent Office, but I know that attorneys are often misled by their clients and how much a burden you put upon them or you are attempting to put upon them, they have to check the veracity and reliability of their own clients. Would you go that much farther now?

"Mr. CLARK. I am not suggesting that. I am saying he is entitled to rely upon what his client tells him. I suggest if he has additional information he should volunteer it himself.

"Senator McCLELLAN. Yes; if he has additional information and the client has not submitted it he shouldn't withhold that from the Patent Office.

"Mr. CLARK. That is correct.

"Senator McCLELLAN. That is what you are saying?

"Mr. CLARK. Yes.

"Senator McCLELLAN. I think that is not unreasonable at all. It might be proper."

In March of this year, the same views which I expressed in the hearings of two years ago were endorsed in different words by Mr. Milton Weissman, Editor-in-Chief of the "Journal of the Patent Office Society." I call attention to the statement which reads as follows:

"Do patent attorneys and their clients, the inventors, really care anything about the validity of the patents issued to them, as long as they can obtain these patents (which may or may not be valid). Here again all concerned take the position that they only want patents of the highest possible validity to be issued. But again, in view of their actual conduct in the prosecution of patent applications, their strict adherence to this viewpoint is open to question. Is it too much to ask, for example, that they at least disclose to the Patent Office the best prior art of which they are aware?"

Mr. Weissman's remarks, which occur on pages 134 and 135 of the "Journal of the Patent Office Society," are attached hereto as Exhibit B, and I ask that they be incorporated in toto in these remarks.

Also, the APLA Bulletin for October-November 1972 at pages 645-6 had the following comments by Mr. Rabinow, a successful, independent inventor:

"I think the patent attorney should tell, in other words, he should help the Patent Office, he shouldn't play games *** we always felt that we should tell them (the Patent Office) everything we know *** and in saying what the prior art was you should say what it really was. Because if you don't do it you are really cheating the Patent Office."

In the same bulletin on pages 635-6, and on the same point, Mr. Dunner, a patent lawyer, stated:

"I think there should be an explicit rule which requires an attorney at some appropriate stage of the application, certainly well ahead of the allowance, to file a written statement of the best published prior art he knows of."

There seems to be a unanimity of opinion that the time has come for all persons to "play fair" with the Patent Office.

Section 131. Examination of application

Section 131 (b) serves the same salutary purpose as Section 115 and should be enacted for the reasons stated above in connection with Section 115. Section

131 provides for the submission of a so-called "patentability brief" and is a requirement, once again, that an applicant for patent be open and candid with the Patent Office. Such a brief will have the further advantage of relieving the Patent Office of much of its burden (and the Patent Office is over-burdened), and will provide a record which will prove of benefit to the parties and to the courts in the event the patent becomes involved in subsequent litigation.

Section 132. Examination proceedings

Section 132 (e) introduces some useful and needed reforms into the prosecution of a patent application. All too often, the file history of a patent is completely silent as to the reasons why the Patent Office finally allowed the patent. Subsection (c) of this section which requires the examiner to state the reasons for his actions and to include a complete narrative report of all matters discussed with the applicant and his attorneys will be very useful. I have suggested in the past and I suggest now that the Patent Office make tape recordings of all oral discussions with the applicant or his agents and attorneys, at the expense of the applicant, and make copies of such recordings available to the public. Verbatim tape recordings will take much of the mystery out of unrecorded interviews which presently constitute critical gaps in the prosecution of a patent application. All too often, the claims of a patent are rejected; the history then shows an interview, the substance of which is not reported in any form; and then allowance by the Patent Office without any real explanation for the change of position by the examiner. Tape recordings of such interviews will remove such clouds of uncertainty from the prosecution history of a patent.

Section 132 (e) also has a desirable provision requiring that amended or new claims presented during the prosecution shall not materially enlarge the scope of the claims of the application as originally filed. If this is adopted, it will prevent that practice of which many courts have complained; namely, the practice of some applicants to hold a pending application in the Patent Office for a number of years and at the last minute adding new and enlarged claims to encompass the latest advances of the art in which the applicant himself played no part. The provision just referred to should foreclose such practice.

Section 122. Public availability, publication, and confidential status of application

Section 191. Deferment of examination

Section 191, which provides for deferred examination of applications, is desirable. It will save both the Patent Office and many applicants a great deal of time and money. The provision is particularly useful in connection with Section 122 which provides for early publication of applications. Since many patents are obtained for defensive purposes it is likely that many applications will be allowed to lapse without examination for the same reason. In addition, the subject matters of many applications which seem to be of great importance when initially filed do not stand the test of time and such applications will within a few years turn out to have little interest and will likewise be allowed to lapse. Thus both deferred examination and early publication of applications offer many advantages with no discernible disadvantages.

Section 282. Presumption of validity; defenses

Section 282 (c) is a change which has long been needed. That section requires the parties in infringement litigation to make definite statements as to their position before trial. I would hope that the courts will require the parties to take such definite positions "as soon as practicable" and not wait until 90 days before trial and 30 days before trial, respectively, which are specified as the ultimate time limits in this section. If this section is properly applied by the courts, patent cases no longer will reach trial and even the appellate stages without either party having taken a position and without the issues ever having been properly defined.

Section 286. Time limitation on damages

This section which reduces the statute of limitations from six years to two years properly takes into account the almost instant means of communication which exist in the world today. Perhaps a hundred years ago a patentee could

not learn of another's infringement for several years. Today, if he is alert, he can learn of it almost immediately and there is no justification in permitting a patentee to sit idly by for a period of six years while potential damages accrue in large amounts.

I have noted with approval the absence of any reference to patent practices and the antitrust laws. Any legislation concerned with such subject matter is unnecessary and inappropriate, and should not be intermingled with legislation that is concerned with patent reform such as the proposed bill.

Obviously, there are many features of the bill which I have not commented upon. I would rather confine my remarks to those changes in or clarifications of the present law which I believe are in the public interest and should be supported. If all of these public interest provisions, both those upon which I have commented and those as to which I have remained silent, should become legislation, then better and stronger patents should issue, the patent system should be improved, and the public interest thereby be better protected. I urge speedy consideration, approval and enactment of this legislation.

Respectfully submitted,

STANLEY M. CLARK.

EXHIBIT A OF STATEMENT OF STANLEY M. CLARK ADVOCATING
ENACTMENT OF S. 1321

	General	Goodrich	Goodyear	Firestone
Angola.....	X			
Argentina.....	X			
Australia.....		X	X	X
Bahamas.....		X		
Belgium.....		X		
Brazil.....		X	X	X
Canada.....	X	X	X	X
Chile.....	X			
Columbia.....		X	X	
Costa Rica.....		X		X
Ecuador.....	X			
England.....		X	X	X
France.....		X	X	X
Ghana.....				X
Germany.....	X	X	X	
Greece.....			X	
Guatemala.....			X	X
India.....		X	X	X
Indonesia.....			X	
Iran.....	X	X		
Ireland.....			X	
Italy.....		X	X	X
Jamaica.....			X	
Japan.....		X	X	X
Kenya.....				X
Liberia.....		X		X
Luxembourg.....			X	
Malaysia.....		X	X	X
Mexico.....	X		X	
Morocco.....	X		X	
Mozambique.....	X			
Netherlands.....	X	X		
New Zealand.....		X		X
Norway.....		X		X
Pakistan.....	X			
Peru.....		X	X	
Philippines.....		X	X	X
Portugal.....	X			X
Rhodesia.....	X			
Scotland.....			X	
Singapore.....				X
South Africa.....	X		X	X
Spain.....	X			X
Sweden.....		X	X	X
Switzerland.....				X
Taiwan.....			X	
Tanzania.....	X			
Thailand.....			X	X
Tunisia.....				X
Turkey.....			X	
Uruguay.....				X
Venezuela.....	X	X	X	X
Zaire.....			X	
Zambia.....	X			

EXHIBIT B OF STATEMENT OF STANLEY M. CLARK ADVOCATING
ENACTMENT OF S. 1321

THE FEDERAL COURTS' VIEW OF PATENTS—A DIFFERENT VIEW

(By Martin R. Horn* and Saul Epstein*)

EDITORIAL NOTE

Almost all recent articles dealing with the subject of the invalidity of patents are based on the premise, either stated expressly or implied, that the courts are applying a standard of patentability which is far too strict. It is high time indeed that the opposite side of the coin be closely scrutinized. As pointed out in the present article the conduct of those responsible for the issuance of patents should be questioned, and this is true regardless of whether or not one agrees with the basic premise of the article that the courts are not applying a too strict standard of patentability.

Do the officials of the Patent Office really care about the validity of the patents which are issued from their agency, as long as the production goals which they set for the patent examiners concerning the disposal of patent applications are met? The official position of the Patent Office is that they desire the issuance of patents of the highest possible validity. But, in view of their actual conduct concerning production goals, this position must be viewed as at least open to question. As long as the officials of the Patent Office demand greater production of disposals each year, even though the number of examiners remains about the same and the amount of prior art to be searched increases ominously each year, it is difficult indeed for anyone with an objective viewpoint to be convinced that they are paying anything more than lip service to the concept of the highest possible patent validity.

Nor are the others involved in the issuance of invalid patents to be considered entirely blameless. Do patent attorneys and their clients, the inventors, really care anything about the validity of the patents issued to them, *as long as they can obtain these patents* (which may or may not be valid). Here again all concerned take the position that they only want patents of the highest possible validity to be issued. But again, in view of their actual conduct in the prosecution of patent applications, their strict adherence to this viewpoint is open to question. Is it too much to ask, for example, that they at least disclose to the Patent Office the best prior art of which they are aware? Then the examination process could be focussed on the issue of whether or not patentable subject matter has been disclosed, in view of the examiner's and applicant's best prior art, which is the best possible way to buttress the presumption of validity accorded to patents by statute.

Finally there are the patent examiners, and their conduct in the examination of patent applications. At this point it must be stated bluntly that what they require is help, not hindrance, in the examination process. It may well be that, as urged by many, the issuance of patents of the highest possible validity by patent examiners is simply not possible if the Patent Office continues to operate under present conditions and procedures. If this is in fact true, then all possible help should be given to them by all interested parties, as noted in the article, concerning grounds for invalidity of which they may be aware.

MILTON WEISSMAN,
Editor In Chief.

Senator HART. Let me make an addition at this point in the hearing schedule. The subcommittee has heard from several former Patent Office Commissioners and the Acting Commissioner currently. I became aware of Commissioner Gottschalk, the former Patent Commissioner, sitting in the audience and listening to testimony given the committee during these days of hearings. Also, I have been hearing reference to the relationship of the Patent Office to the Department of Commerce and the question of whether that

* Spensley, Horn, Jubas and Lubitz, Los Angeles, California.

Patent Office should be made an independent agency. That is a proposal that is contained in S. 1321. I think Commissioner Gottschalk is in a position to bring us first hand knowledge and private experience to that otherwise theoretical question of should we have an independent agency? And at my request he has agreed to appear this morning. I welcome him.

Mr. BRENNAN. Mr. Chairman, just a brief statement for the record. Both the counsel for the subcommittee and the counsel to the Minority Leader were available in their offices until 5:30 last evening. The first we were informed of this development was at 9 a.m. this morning. The well-established practice of the subcommittee has been to request witnesses to submit statements 24 hours in advance. The subcommittee staff has tried to cooperate with your staff on these hearings. I regret that we were not extended the same courtesy. Thank you Mr. Chairman.

Senator HART. I regret that that sequence of events occurred and will assume full responsibility for it. I did not determine until midday yesterday afternoon to invite the Commissioner. It never occurred to me it was a clear violation of the 24-hour rule, a rule very difficult to enforce in other committees, but a very desirable rule. Your comment I think is completely proper. My explanation does not change that. You should have been advised.

However, I felt it was desirable to call the Commissioner for two reasons: First, to get your reaction, Mr. Commissioner, generally, to the concept of the independent agency proposal, and, secondly, to ask of you a question that I asked of an earlier witness to react to trade press reports as to the circumstances and reasons for your resignation. As I understand the problem it relates directly to the independent agency proposal.

So let me ask first the question that I directed to the Commerce Committee witnesses and I hope I am almost reciting literally what I asked them.

It has been brought to my attention through trade press reports that Commissioner Gottschalk was fired without prior warning by the Assistant Secretary for Science and Technology for three reasons: Refusing to give special consideration to a particular patent application, advocating the many other reforms in S. 1321 to the displeasure of the organized patent bar, and arguing that since patent reform was so vitally needed, the administration should not risk the fate of 1971 and should sever the antitrust considerations from the patent reform considerations.

Would you describe, Commissioner, the circumstances that attended your resignation and specifically what your opinion is in respect to the accuracy of those reports?

STATEMENT OF ROBERT GOTTSCHALK, FORMER COMMISSIONER, U.S. PATENT OFFICE

Mr. GOTTSCHALK. Senator, let me acknowledge your invitation and my willingness to appear. I hasten to explain that as you might anticipate, I have had mixed feelings about appearing as a witness in these hearings but felt that I had no choice in the light of your remarks yesterday followed by your invitation to testify.

I certainly must agree that your inquiries are directed to points which I would consider most relevant and undoubtedly important in arriving at appropriate solutions of the problems with which the committee is now concerned. If my participation in these hearings, and if drawing upon my past experiences can be helpful, then I would regard it as desirable to make myself and those experiences as fully available as possible. I would like not to be misunderstood in that, I was concerned—and I think understandably so—lest any voluntary approach on my part be misunderstood in the light of the developments to which some of your inquiries have been directed.

It might be appropriate to point out by way of general background that I spent approximately 3 years in the Patent Office.

I joined the Patent Office as Deputy Commissioner in the spring of 1970. I became Acting Commissioner on or about August 25th, 1971. I became Commissioner by recess appointment on January 4 of 1972. I was later confirmed by the Senate and, pursuant to Senate confirmation, reappointed. My resignation from the Patent Office and from Government service was effective June 29.

Part of what concerns us of course is your interest in determining the circumstances with respect to, and indeed the nature of, that resignation. I can describe the mechanics of what happened. I don't believe I am in position to answer in detail questions raised with respect to the three points you mentioned, for the reason that in truth, I do not know why I was fired. I think possibly that the references with respect to those points may have some basis in fact, but I would regard this—on grounds of reason and probability—as unlikely. I could be wrong. The fact remains that I do not understand and was never given any adequate explanation of the circumstances attending the request for my resignation.

I will, as best I can, outline the situation broadly. I must say that at the time I was appointed Commissioner I was greatly surprised, but I think possibly that the appointment was a direct response to the efforts which I had been making while Deputy Commissioner and Acting Commissioner. The point I would make there is that the then Secretary, Mr. Stans, had been very concerned about the internal state of the Patent Office and I knew that he was deeply interested in dealing effectively and promptly with many of the important problems with which the Office was struggling. I think it not unfair to characterize his approach as one of near-desperation, impatience, and perhaps even anger. I do know that there were tense moments between us; but I know too that as time went on, and as he became better acquainted with what was going on as I attempted to achieve his objectives, he became more optimistic about the resolution of those problems. What I am saying in short is that what had begun as a relatively antagonistic experience resulted in one of very close cooperation and, on the part of the Secretary, appreciation expressed many times for the "fine work" that I was doing in my role as Commissioner.

I seemed also to serve well and by all standards to satisfy the requirements that his successor, Mr. Peterson, imposed. We had an excellent relationship.

It was against that background that it came as a total surprise that the things that I was doing seemed so totally unacceptable. The

whole chain of events came as a "bolt from the blue" and indeed with no prior warning.

On April 19, well, let me go back a little bit further. The Secretary came aboard in January of 1973. Shortly thereafter, in the office of the then Acting Assistant Secretary for Science and Technology, I and other members of the Science and Technology units of the Department of Commerce, together with the Acting Assistant Secretary, provided briefings for the Secretary. Presentations of the various units of the Patent Office, the National Bureau of Standards and others, averaged about 15 to 20 minutes each, at most. As it happens, the presentation by the Patent Office, which I made, was the last. It was no longer than 20 minutes. It may well have been more like 15. At best it sketched in broadest outline the functions of the Patent Office, its staffing and funding situation, its physical facilities, and little else. At no time thereafter did I have with the Secretary any discussion relating to Patent Office affairs or problems. Indeed at no time thereafter, with the one exception to which I will refer later, did we ever have any discussion beyond the merest kind of social and casual contact, at receptions or matters of that sort. I assumed, perhaps incorrectly, that he was aware of and satisfied by what I was doing.

On April 19, as I recall the date, the present Assistant Secretary for Science and Technology was sworn in. On May 7, a Monday morning, I received at 8:30, a telephone call in which she requested that I appear at her office at 9 o'clock. I did. As I entered, she motioned me to a chair and proceeded to speak directly to the point. She said very briefly, in what I recall as approximately as three sentences, that she was aware that I had indeed been doing a very fine job; she recognized that I had made great strides, particularly in dealing with some of the people and personnel and policy problems of the office; and that I had made other strides forward as well—but that I had a fatal fault or flaw, and that as a result of that she felt constrained to ask for my resignation.

To say that I was stunned of course would be an understatement. I inquired as to the reasons for the request and I received no answer that I can repeat; none that I then thought I understood or could begin to accept, because at best there were the vaguest references only to such things as inability to get along with the top managers of the Patent Office. There was a vague reference to support for her position in that respect in an audit report, then presumably still in process of preparation by an audit team from the Department of Commerce, access to which I did not have at that time. So that as I heard the few words spoken in that connection, I had absolutely no way of knowing what she might have had in mind and indeed I was surprised by the reference for a still further reason—this represents a digression but I assure you a minor one, namely, the effort that was covered by that report was one that I had initiated some months before. I had requested that the Department of Commerce, working with specialists from the Civil Service Commission, provide assistance which I felt was needed. I had identified certain problems. I realized they were deep rooted and difficult to deal with. They were the kinds of problems which I suppose permeate many government

agencies, and I could not break through the bureaucratic redtape and built-in resistances to the point where I could accomplish the degree of improvement that I thought was necessary.

The request for expert assistance was intended to help solve these problems. I later found, when the report came to my attention, shortly before I left the office, that the report was prepared on a basis that reflected nothing of its genesis. It purported to identify to me the problems which I had identified in the first place in my request—the inference being that I had in fact been deficient in, presumably, failing to recognize the existence of these problems.

What I am suggesting is that that whole situation—with respect to the report and the study on which it was based—may be symptomatic of the fluff that surrounded whatever reality may have been responsible for the actual request for my resignation. The words I heard and the report itself seem artificial, contrived, and for the most part irrelevant.

I was not asked for a resignation on the spot. The request was that by the following Monday, May 14, I return with a draft letter or resignation. It was of course to be addressed to the President. It was stipulated that it was to be effective June 30.

The suggestion was made that I refer in it simply and generally to a desire to return to private life. The suggestion further was made that, in the meantime, I seek employment elsewhere. I explained in response that it was very difficult for me to cope with a situation I didn't understand, and it was very difficult for me to take seriously the suggestion that I seek employment while in government employ, and particularly so for the reason that I was facing the necessity to be in Vienna for the Vienna Diplomatic Conference from approximately the middle of May until the middle of June. To no avail. The request was insisted on, that I return the following Monday, May 14, with the draft letter of resignation.

I withdrew on that basis, pondered, and concluded that I could not submit a resignation under those circumstances. I did, in fact, prepare a letter explaining how I felt on that point and stating my position that I felt in any event my obligations to the patent community, and to the President who had appointed me, were such that I could not so resign without a full understanding.

I planned to meet with the Assistant Secretary on Monday, May 14, but could not do so because she was then en route to Washington from Seattle. And as it happened, the following day, May 15, was the last day on which I could possibly leave for Vienna and still get there in time to perform my function as head of our delegation, and meet with our people for 1 day in preparation for the formal opening of the conference the following day. So faced with the request that I have spoken of, faced with the time frame I have just indicated, and working against the background of the June 30 date which she had stipulated, I thought probably the best thing I could do would be to go over and get the things started at the conference, and deal with this problem later, having no doubt that I could. But not so. Tuesday morning in telephone conversations, the message came to me. I would use the words of that message rather exactly at this point: This memorandum came to me addressed to Commis-

sioner from Mickey Jo, one of the secretaries in the office, dated May 15. The content:

Helen Snyder from Dr. Anker Johnson's office called at 8:50 o'clock to say that they had been left a note by Dr. Anker Johnson to be transmitted to you as follows: "Mr. Gottschalk is not to leave the country without seeing Dr. Anker Johnson. Please be sure that he understands this." Dr. Anker Johnson is at NBS this morning at a symposium and Ms. Snyder says if you get in touch with her there, it would probably be best to call Dr. Roberts' office.

Well, I tried, indeed I tried, to reach her. Eventually there was a break in the symposium, and I spoke with the Assistant Secretary for approximately 3 to 5 minutes on the telephone. She was very insistent that I would not be permitted to leave the country without having submitted the resignation that she requested. I pointed out that she was putting me to a choice, and that I felt constrained to fulfill my obligations with respect to the treaty—that on the one hand, and my job on the other. She insisted that, treaty or no treaty, she was determined that my resignation be handed in that day. I felt that, as a practical matter, I had no choice but to submit the resignation that was requested and I did, under exactly those circumstances.

You have referred to trade press reports. There was one column which recited briefly and essentially accurately the substance of what I have just related with respect to the specific mechanics of that request.

I turn back to the Friday afternoon of the week of May 7 to report that late that Friday afternoon at approximately 5:30 p.m. I succeeded for the first time in meeting with the Secretary. I told him what happened. He listened with no visible reaction, made no comment, and when I concluded my statement, stated simply that since the Assistant Secretary had responsibility for the operation of the Patent Office, he had no choice but to sustain her decision as a proper exercise of her authority. That is all that I can really tell you about how. It's practically all I can tell you about why.

Now I must say that I do favor some legislative clarification of the patent antitrust questions concerned with licensing. I must say also that I think it rather important that there be early enactment of patent legislation. I had suggested—but only in the course of what I would consider appropriate conference discussion within the executive branch—the view I held, that the early enactment of patent legislation was of such importance that, in my opinion at least, it should not be delayed by insisting upon the enactment at the same time of legislation dealing with these licensing questions. So far as I know that was never taken to be an objectional utterance. As far as I can recall, no criticism of that approach was expressed, then or later.

Now I have spoken to one question you have raised. It obviously has a bearing on my feelings and views with respect to the other, the status of the Patent Office as an independent agency.

Senator HARR. Well, let me interrupt you here if I may, Commissioner. In part this is a reaction to Mr. Brennan's appropriate statement. The subcommittee has authorized these hearings in order to get reactions specifically to five points in the reform proposal. One

of those points in the desirability of a restructuring of the Patent Office and should it be an independent agency? My conscience is clear to the extent that we are authorized to take testimony, including the experience you related, as it bears on that one item and that is the independent agency question. The hearings were not authorized to investigate the circumstances of your dismissal.

So, I welcome your turning now to the general observations that you will make with respect to the provisions for an independent office and I think all of us would understand that your general observations necessarily are colored by the circumstances that you have just described.

Mr. GOTTSCHALK. Thank you, Senator. I turn now to matters that are a little easier for me to discuss.

I think I must say that the Patent System which is of great concern to us all, has been my life work for more than 40 years. I believe in our patent system. I have said many times that I think it is sound in principle, morally right and extremely important. I am totally dedicated to it because I believe it does for this country what we need to have done. I think it is not doing it as well as it should. I am very anxious and concerned to improve it. This has been the thrust of my activities in the Patent Office.

I am very much in sympathy with the drive to accomplish, at long last, some of the things that we have begun, increasingly, to recognize as necessary and important. In my own work in the Patent office I have tried to act accordingly to my own conviction that there is a need to ventilate and to make more effective, the entire patent examining procedure. We have made a start, within the limits of time and in the absence of legislation, toward the interpartes proceeding. We have initiated efforts that concern completeness of file wrapper, to break down the barriers of secrecy that properly and understandably infuriate and puzzle so many. What I am saying is that as we approach patent legislation, I find it a source of gratification that we can anticipate the early reporting of a patent bill long overdue and much needed.

I believe in the importance of improving the system. I think that legislation is required. I am enthusiastic about the prospects of having a better patent system based on better legislation.

But before I address myself directly to the matter of the independent agency, Senator, I think that there is a preliminary question that needs to be considered. I think we have to recognize that the difficulties experienced with the patent system, with which we are all familiar, and which we are trying to correct, are not to be attributed—certainly not in their totality—to shortcomings in our present legislative structure. And by the same sign, I think it would be quite a mistake to suppose that by the enactment of appropriate patent legislation these difficulties would necessarily be resolved. Not so. Something more—something far more basic—is required.

As I view it, that something is good administration—stability, the ability to do the job, to do it well, and to do it consistently. One of the things that Senator McClellan commented on in his remarks introducing S. 1957 was the fact that during his tenure as chairman of this subcommittee there had been five Commissioners of Patents;

and he was concerned, quite properly about the high turnover and the short tenure with respect to the Commissioners' position. In my 3 years in the Patent Office there were of course two Commissioners—but there were three Secretaries, and there were four people in the position of Assistant Secretary for Science and Technology.

Senator HART. Over what period?

Mr. GOTTSCHALK. Three years. With every change in personnel, with every change in policy, in the Department of Commerce, shock waves permeated and had their impact on the Patent Office. We had to react to the new personalities. We had to react to the new programs. We had to participate in a different way and about different things.

So against that factual background, which indicates the general instability of the situation, I would turn to this matter of administration, which I consider to be absolutely vital, and which I think is inadequately understood and appreciated and all too often overlooked.

I was very gratified, earlier in the course of these proceedings, to note the committee's sensitivity in these very areas. The inquiries appropriately directed to such things as the quota system, for example, are not within the five points listed, but bear most importantly on the very essence of what the patent examining function is all about. There can be no mistake about it, the patent examining function is the *raison d'être* of the Patent Office, and the Patent Office is the very heart of the patent system.

As a matter of administrative efficiency, I think we would all agree that good communications are very important. In that connection, I was interested to note the sensitivity and the insight of the committee as reflected by its interest in probing the disparities which seemed to appear between the views taken by the management of the Patent Office and the Department of Commerce on the one hand, and the Patent Office examiners themselves on the other. I felt, and perhaps others did, that that was rather significant. It pointed up something I have experienced, and that is the compartmentalization of thought and of action in the Patent Office in every respect—the preoccupation with self and one's own functions, the inability to see the large picture, and to understand the goals and to cooperate in the accomplishment of the Patent Office mission. It is these precise things to which I have been directing during my tenure my primary attention. These are the things in which I have been placing primary emphasis. It is most important to understand that when you ask questions having to do with the existence or nonexistence of a quota system and try, as apparently you did Senator, for 2 days and fail to get a satisfactory response, it is indicative of a situation which applies to more questions than just the one then under consideration.

The Patent Office is a wonderful institution. It is hard for me to put in words the feeling as well as the regard I have for it and what it has meant to this country. Perhaps that is the reason that I am so very disturbed, as I have been from time to time, by the seeming indifference or the seeming opaqueness of individuals who play important roles in what it does, who are all too often inclined to

think of themselves as performers of daily tasks rather than as people contributing importantly to the achievement of national goals. One of the lines that I have used repeatedly in my efforts to reach the employees of the Office has been that we are not to think of ourselves as laying bricks but as building a cathedral.

Now there have been remarkable changes in personnel attitudes and in morale and this has been very important in achieving the kind of administration on which the successful operation of a Patent Office depends. I would be the last to discount and the first to praise the importance of the professional input at the Patent Office. But it is a fact of life that the professionals' tasks cannot be well performed unless the support functions are carried out adequately. It is rather ridiculous to expect the public to have confidence in a Patent Office which can't deliver documents as promised, which have been ordered and paid for—which purports to issue patents on a certain day, and which cannot make copies of them available for weeks after their official date of issue—an office in which files are lost, literally, so that they cannot become available for the further processing of the claims that are so important to the applicants who filed them. It was a Patent Office of that kind which I encountered, and it was to overcome difficulties of those and many other kinds to which I directed my efforts. It is against that kind of background that I speak with feeling to the matter of the importance of administration.

It seems to me—I might say that these remarks from which I will read in an attempt to conserve the time of the committee at this point were prepared in a totally personal and totally different context and they have no relationship to the totally unanticipated appearance I am making before this committee this morning. But it seemed to me that what I said then is what I would in any event say to this committee now.

I was saying that we need to look beyond legislation to good administration. At the very least, I would say this requires close, critical, and continuing scrutiny of, first, the tools, the skill, and the procedures employed in the operations of the Patent Office; second, the criteria used to measure product quality and examiner performance; and third, the motivational and the attitudinal factors affecting performance of the professional and support personnel. Such review must be supplemented by appropriate remedial action; and the process of review and improvement must be pursued relentlessly. Some progress along these lines has been made, but much more remains to be done if the integrity and effectiveness of any form of patent examination process is to be insured.

Consider, as an example, the admittedly unacceptable state of the critically important Patent Office search files. Now, it is extremely important to recall that the search files in the U.S. Patent Office are unique. This is the only place in the country where classified files which permit an effective and efficient search can be found. Files exist elsewhere but they are not comparable in scope or in arrangement or in effectiveness. A peculiar responsibility rests upon the Patent Office therefore to insure the completeness, the integrity, and the effectiveness of those files.

The programs which were recently instituted—and I mean within the last 2 years—to check the integrity, that is the completeness of the files and to correct their deficiencies, represent the first such efforts in 25 years. Now there has been a lot of discussion of legislation in the last 25 years, but precious little consideration of so vital an issue as that.

Similarly the revitalization of the reclassification effort in respect to these files, which I started early in 1972, was long overdue. Its completion will require several years of sustained and substantial effort.

Now earlier reference has been made in the course of these hearings to the matter of classification. Let me add one thought that I think has not been expressed. As technology develops rapidly in the areas that are currently of greatest importance, there is an increased output, at a greater rate, of new technical information. Unless the inflow of new technical information at the Patent Office is classified promptly and effectively, it becomes increasingly difficult to make the kind of efficient and effective search on which a good patent examination depends. Now it was a little while before I realized, after I had entered the Patent Office, that the work of maintaining this ongoing and highly important reclassification effort had been abandoned virtually completely. The result was that the examiners were, day by day and week by week, in a deteriorating position with respect to the performance of their mission. The funds appropriated for that purpose in the normal course were, as we say, reprogramed in order to sustain a research and development effort aimed at developing a computerized system for performing the essential work of classifying new technical information.

I suppose I might be permitted a digression at this point to go back and say that one of the factors contributing to the request for my resignation might well have been the fact that in trying to remedy problems of this kind I probably made few friends and most certainly must have made some enemies. There were people who were deeply committed to these projects and who failed, I think, to share my view that some of them had to be reconsidered.

This matter of computerized reclassification is certainly a case in point. I found it was essential in order to preserve the effectiveness of the Patent Office—to prevent the patent examining function in my judgment from going down the drain—to abandon that, and to revitalize this “manual,” as we call it, classification effort. In the process I had to relieve from his position (and to eliminate the position) one person in the office who at the time held the title of an Assistant Commissioner. That caused him great pain and discomfort. In time I also suffered considerable pain and discomfort, and also some annoyance, and diversion of a very substantial amount of time in responding to letters from many sources including members of the Congress protesting on his behalf—

Mr. BRENNAN. Mr. Chairman, I feel compelled to request you to request the witness to direct his comments to the issues which are relevant to this proceeding. I think we are going far afield here.

Mr. GOTTSCHALK. I'm sorry.

Senator HART. Yes sir.

Mr. GOTTSCHALK. Thank you. I appreciate that.

In any event, unless these basic tools, through continuing efforts to maintain them up-to-date and in good working order, are brought to and maintained in a condition permitting effective and efficient examination, nobody, under any system—not the examiner, nor the public counsel nor anyone else—will be able to make reliable and meaningful determinations of novelty. And such determinations are the very bedrock on which all aspects of our system depend.

Similarly, if the rules of the game by which patent examiners work, and if the criteria by which their performance is judged and their promotions and salary increases are awarded, are such as to favor quantity of production over quality of work product, concepts of professionalism and quality will be subjected to a compromising strain which poses a constant and substantial threat to the proper performance of the Patent Office mission. That kind of a system provides powerful incentives to do the wrong things rather than the right things.

I would say, on the basis of my own experience and in terms of such basic administrative matters as those to which I have referred, that strength of administration, stability of administration, and soundness of administration can best be insured in a situation which would make the Patent Office independent of the Commerce Department.

Now Mr. Browne traced very accurately and interestingly yesterday the history of the Patent Office, and this committee has been informed that there is no evidence that the Patent Office at any time has been subjected to any improper influence in the performance of its mission. I feel constrained to deny this for, on the basis of my experience, I know this not to be so. I accept as valid the observation that there has been over the years an apparent inability of the Department of Commerce to develop and maintain an effective working relationship with the Patent Office, and I don't think that we can anticipate any significant improvement in this kind of relationship if the formal structure were to remain as it is—and that seems to have been the position proposed by the administration yesterday.

Now that position rests largely on the basis of the Commerce Department being able to provide administrative and similar support, which the Patent Office would have to provide for itself if it were independent. Fine. That argument has merit as far as it goes, but there is another side of the story, too. And that is, that because of the family relationship there are corresponding burdens. I have already indicated that with every shift in the administration or in administration policy, the burdens of the Patent Office are enhanced.

There is another aspect to this thing that bothers me very considerably. I don't think many people, inside or outside of the Patent Office, are aware that regularly substantial sums of money appropriated for the Patent Office are siphoned off for other uses within the Department of Commerce. That is bad enough, but I think that the seriousness of that threat is underscored by a very recent development. This year for the first time—I think this is not inappropriate for disclosure for the purposes of this committee and I hope I am

right, Senator--this year the Patent Office funding request was not presented individually as it traditionally has been; it was consolidated with the requests of the other units of the Science and Technology wing of the Department of Commerce and a single appropriation request for that group of five units was made. Which is to say, if this is projected into the future, that there probably cannot be said to exist such a thing as a Patent Office appropriation. This means that the purse control of the Patent Office is on a totally different basis than it historically has been. And when you consider the fact that the Office is under—as I have already indicated my experience confirms—the control of someone whose interests are not basically and primarily oriented to the Patent system but to other things, such as science and technology, this has rather interesting implications. I could easily substantiate in time, by examples, the fact that this inherent possibility is indeed a reality. It could become increasingly a problem.

Mr. Browne pointed to the strange dichotomy by which the Presidential appointee who heads the Patent Office is subject to review by the Judiciary Committee, whereas that person's superior, to whom he must indeed respond, and with those directives he must indeed comply, is subject to review by a totally different group. And it was rather interesting I thought, in this connection, that during the confirmation hearings of the incumbent Assistant Secretary for Science and Technology Senator Tunney pointed rather perceptively to the fact that, while the incumbent Assistant Secretary was to be highly commended on the grounds of scientific prowess, there was very little in the record to suggest any background of dealing effectively with administrative matters, legal and patent matters, and things of that sort. It is a matter of grave concern that an agency of over 2,700 people, and, as you have heard, over 1,100 professionals, should be subject to the influence of someone who has had relatively little occasion to become acquainted with the barest fundamentals of what is involved—either in terms of the specific functions or the management skills involved in that kind of an operation.

Now I do believe that the matter of improper or undue influence is not just confined to the last 2 years or so; it has, however, been very strikingly in evidence. I speak again to one of the three points you mentioned earlier. There was not, so far as I can recall, any situation directly involved in the terms which you used—and I can't recall them exactly Senator—in connection with picking out a particular application and dealing with it, as it were, out of turn. There was not that kind of a situation, but there was something that I think is not too different from it in basic principle. I can't particularize at this point because the specific matter is still pending, and under our law the facts relating to that situation must be preserved in confidence. But the fact of the matter is that the Commissioner was directed to follow a certain course of judicial action contrary to the determination that he and the general counsel agreed was sound. That seemed to me a bit much. By the same sign, I think—

Senator HART. But as you indicated, it is almost inherent in the structure as we now have it, which to me argues persuasively for the desirability for an independent agency.

Mr. GOTTSCHALK. Precisely. There has been such an absence of specific knowledge about these things as to encourage bland acceptance of the generalized statements that this doesn't exist. I confirm to you in rather positive terms and very specifically that it does, and it is not new.

You will recall that Mr. Browne mentioned the name of Assistant Secretary Holloman yesterday—and that was back a few years, but there again the same basic structure existed. A good deal of influence was brought to bear.

Now at this point I think I should mention specifically that in my judgment the Administration bill, so far as the language of it is quoted in their statement, does not go far enough. Their proposal in essence was, as I understand it, that the Patent Office remain where it is, but that legislation be enacted to insure that the Patent Office would enjoy independence of the Department of Commerce with respect to its "adjudicatory function." Well, I submit that that is not enough, because that would leave the Patent Office subject to the influence of the Department of Commerce with respect to matters of general policy, legislation, treaty arrangements and the like—and it was indeed a matter within that general category with which I most associate the experience of some years ago to which Mr. Browne referred. So we can't look to that language as providing an adequate safeguard, even if for other reasons we were to accept the views of the administration that the Patent Office ought to stay put.

I agree with you, as I understand your position, Senator, that an independent agency is strongly indicated.

Senator HART. Commissioner, thank you very much. I think your testimony does bear strongly on the desirability of an independent agency because I think inherent in this structure will be the recurrence of both lack of continuity and the competing claims. Whereas with an independent office perhaps the tendency there and the criticism then would be that it would overstress the importance of patents and their role, but at least they would be preoccupied with patents. I am grateful that on such short notice you have been willing to come in and give us the benefit of your experience and opinion. Again, thank you.

Mr. BRENNAN. What is your position, Commissioner, on the proposed Office of Public Counsel?

Mr. GOTTSCHALK. I would say this, Mr. Brennan, it is a little difficult for me to answer as clearly as I should like for these reasons. I am clear that I would not be in favor of the public counsel functions as proposed in S. 1321. I think some limitation and refinement and sharper focusing would make that more effective. I am totally committed to the idea that some representation of the public interest, and some broadening of legal approach within the Patent Office, are necessary. It is a little difficult for me to speak to the administration bill because, as you must be aware, I don't know what it is. I know about the administration position only what we have been able to learn from the remarks of Mr. Kauper and Mr. Bakke. I have a strong feeling that there is a better likelihood by far that I would agree with those positions dealing with the public counsel than I would with those of S. 1321.

I feel this, too. The Advisory Council which is provided for in S. 1321, and which has not been much discussed in the course of these hearings, seems to me potentially very important. I would strongly favor such an arrangement concerning the public counsel as would make it possible for him—nay would require him—to provide effective input to the Advisory Council. I would not go so far as to say he ought to be constituted in any specific capacity such as executive, secretary or official bird-dog, but he ought to be the eyes and ears of that committee. It ought to be made clear by the legislation that he is to have complete access to any information within the Patent Office. I tend to shy away from any concept of the role of public counsel, however, which would get him too deeply involved in representing the interests of private parties.

I can't help but deal also with the matter of adversary proceedings to some extent because I think they and the role of public counsel are very closely related. I do feel that if adversary proceedings are initiated in any form, this is an area of activity which ought to be of special concern to the public counsel—not necessarily in the role of an advocate, or even as a participant, but from the standpoint of exercising close and continuing supervision to insure that that important—and for us new and untried—experience develops properly, to insure that the system is improved in the way that we would hope, from the adoption of such proceedings. Here again, the way in which he would perform what functions would have to be determined by what kind of adversary proceedings we adopt.

May I speak to that issue very briefly?

Mr. BRENNAN. Yes, but please be brief, we are running a little late.

Mr. GOTTSCHALK. I appreciate that Mr. Brennan, and the opportunity to speak to the issues at all.

I would not favor the form of adversary proceedings that are set forth in S. 1321. I more incline to the administration's view, but with reservations. There are two basic routes which they propose. I feel that the first offers too little, for the reason expressed this morning by Mr. Clark, that is, that people will not come forward with prior art unless they are really confident that it will be applied properly. As to the second, I am afraid that this alternative provides too much, and that it would open up the continuing kind of litigation which has characterized the German opposition proceedings which we view with horror. I am not sure that the antitrust approach suggested by Mr. Kauper would be adequate to control this.

I do favor something more like the idea which had its genesis in the Patent Office proposal which was published some time ago.

Mr. NASH. No questions.

Senator HART. Thank you. That last answer reminds us how tough it is to move from agreement on what generally is desirable to how in the world you get there.

Mr. GOTTSCHALK. Senator, it is actually again the same point we were making earlier: administration and implementation are interchangeable sometimes.

Senator HART. Thank you.

[Subsequently Mr. Gottschalk submitted the following letters with attachments. The attachments may be found in the committee files.]

ARLINGTON, VA., September 18, 1973.

Senator PHILIP A. HART,
U.S. Senate,
Washington, D.C.

DEAR SENATOR HART: In the interest of clarification and completeness, I would like to supplement my testimony in connection with S. 1321 as follows:

FURTHER SUPPORT OF THE INDEPENDENT AGENCY CONCEPT

Attached is a copy of the relevant part of the book "*The Patent Office*" by Stacy V. Jones, who has covered this agency for the New York Times for over 20 years.

CONCERNING UNDUE INFLUENCE

My testimony, as well as Mr. Browne's, made the point that the Patent Office has been subject, over a long period, to undue or improper influence by the Department of Commerce. However, it was not my intention to suggest that such influence was exerted throughout such period.

On the contrary, and specifically, I would make it clear that at no time during my period of service in the Patent Office did Secretary Stans, Secretary Peterson, Assistant Secretaries for Science and Technology Tribus and Wakelin, or Assistant Secretary for Administration Jobe exert any such influence. These officials were in fact, very helpful, and did much to aid and support the Patent Office.

Further, it should be added that the directive from the acting assistant secretary referred to in my testimony, was not followed. With some difficulty, he was persuaded by General Counsel William N. Letson and myself that it should not be.

WHY I WAS SURPRISED

In my testimony, I indicated that Dr. Anker-Johnson's request for my resignation came as a "bolt from the blue". In that connection, the following additions to my testimony may be of interest:

At the time of that request, she had been aboard for about three weeks.

During that period she had virtually no contact with Patent Office personnel. Her orientation to Patent Office affairs was necessarily limited and superficial. She paid no visit to any Patent Office facilities, including those in the Commerce Department Building which I urged her to visit.

The foregoing statements, in all essentials, apply also to the Secretary. He did not visit any Patent Office facilities; nor become acquainted with Patent Office personnel; nor discuss with me at any time any programs or problems of the Patent Office.

Right after the November 1972 election, all presidential appointees were required to submit proforma resignations. I promptly submitted such a resignation, but heard nothing concerning it until the middle of April 1973. It was then returned to me with a note of congratulations by Assistant Secretary for Administration Turner indicating that I would continue as Commissioner. Three weeks later, Dr. Anker-Johnson requested my resignation.

Throughout my Patent Office service, I had every indication of solid support from:

The patent bar—as exemplified by letters from lawyers including the presidents of the Chicago, New York, Rochester and Philadelphia patent law associations.

Industry—as exemplified by letters from companies large and small, and industry associations.

Superiors and associates—as exemplified by letters from Former Secretary Stans, Former General Counsel Letson, Former Assistant Secretary for Administration Jobe, and Assistant Attorney General Kauper.

Patent Office employees—as exemplified by excerpts from employee organization publications and various communications from employees.

All indications were that I was ably and effectively representing this country internationally.

Letters from the heads of the German, British and Canadian patent offices reflect cordial and effective working relationships with virtually all of the industrially important and many of the developing countries. Because of their confidence in me, I was elected Chairman of ICIREPAT—an international patent body dealing with many basic and world-wide problems.

At the recent Vienna Diplomatic Conference, I directed the U.S. negotiation of the Trademark Registration Treaty, which I signed on behalf of the United States. I also chaired several important sessions of the Plenary Committee at that Conference.

My relationships with other Government agencies were excellent, and in all cases represented significant improvement. This included the State Department, the Department of Justice (with which I established an ongoing program of cooperation in areas of mutual concern), and the Government Printing Office.

IMPROVEMENTS BY ADMINISTRATIVE ACTION

By way of emphasizing my testimony concerning the importance of administration, it should be noted that over the last two years virtually all aspects of Patent Office operations were substantially improved solely by administrative means.

The nature and scope of such improvements are reflected by the enclosed: Representative press articles.

Partial list of improvements effected in the three month period August–November 1971.

Address to the American Patent Law Association on May 10, 1973.

Further, it should be added that the "audit report" mentioned in my testimony was not confined to criticism. It reported on, and praised, much that I accomplished. (Perhaps the Committee might wish to review this report as concerns not only my performance as Commissioner, but also the puzzling circumstances attending my forced resignation. The Commerce Department would no doubt make it readily available.)

THE PATENT BAR WANTS BETTER PATENTS

Congressman Owens, Judge Will and others from time to time, have charged that the patent bar is resistant to change, and also "opposed to making the Patent Office function effectively".

As I recall, it has also been suggested that, in trying to make the Patent Office more effective, I alienated or antagonized the patent bar. I do not believe this for a minute.

Patent lawyers, inventors, corporations and members of the general public have all repeatedly stressed to me the importance they attach to improving the quality and enhancing the validity of the patents issued by the Patent Office. This accords with my own observation, over many years, that the overwhelming proportion of those concerned with patent matters have been frustrated, rather than pleased, by shortcomings in the patent examining process.

Admittedly, the patent bar on the whole has been very conservative about change. Accordingly, it has fallen to others, of lesser skills and experience in patent matters, to develop proposals for change. It is therefore hardly surprising that such proposals have often been criticized and objected to by the bar. But this is a far cry from saying that the patent bar wants lower standards of patentability, easier issuance, or weaker patents. I am sure it does not.

Currently, I believe the patent bar is becoming increasingly interested in promoting improvement; this change of attitude has been reflected in the hearings on S. 1321.

"MECHANIZED" OR "PUSH-BUTTON" SEARCHING

The ability to classify, store and retrieve information by computer or similar means would contribute immeasurably to the efficiency of the patent examining process. Stacy Jones has called this a "Patent Commissioner's dream".

But despite a great deal of attention to such matters for many years, there has been little real progress; and the resultant disappointment can be readily understood.

However, the subject itself is not readily understood. In fact there has been, and is, much misunderstanding concerning it. As mentioned in my testimony, this subject has generated much criticism and conflict and has been the focus of various operating and personal difficulties in the Patent Office.

Section 6(e) of S. 1321 reflects the Committee's concern with this subject. In view of its basic importance, a brief statement of the Patent Office situation concerning it would seem to be in order.

Patent Office programs of research and development in this area over a period of years have cost much and yielded little. When I became Acting Commissioner, my awareness of this, and of the importance of this subject, prompted a careful review of what had been done in the past, and also of the efforts then underway with respect to "Project Potomac" (referred to in my testimony, although not by that name.)

I concluded, in November 1971, that I had no alternative but to curtail Project Potomac. I did so, for these basic reasons:

First, taking at face value the most optimistic views urged by its proponents, Project Potomac would at best have provided the Patent Office, three or four years hence, with the capability to process only a minor portion of the vast volume of material required for Patent Office purposes, with the balance being left to be handled by conventional means.

Second, the substantial costs of Project Potomac had been funded by diverting funds from, and virtually completely abandoning, the highly essential "manual" classification program.

By the time I became Commissioner, this had already resulted in great deterioration. And since the "manual" classification system is the primary working tool of the patent examiner, its restoration was a pressing need of the highest priority.

My decision in this respect was approved by Assistant Secretary Wakelin and by Secretary Stans. It was also in accord with advice I received from computer experts of IBM and from Price, Waterhouse consultants then working with the Patent Office.

Nonetheless, I was determined to insure that we derived from the work done on Project Potomac everything of value developed thereunder; and also, that the Patent Office would maintain a forward-looking research and development program in this area. But this program would have to be based on a full and careful analysis of the Patent Office and its operational needs, and pursue a planned and logical approach to the satisfaction of those needs.

To maximize our prospects of success, I arranged for a team of experts from the National Bureau of Standards to assist the Patent Office in this program.

After careful and extended study, they concluded that Project Potomac was not a valid means of accomplishing the objectives to which it was directed. Their reports also provided a better basis for forward planning and progress, in my view, than had ever before been developed.

THE NEED FOR PROMPTLY FILLING KEY POSITIONS

The position of Commissioner has now been vacant for almost three months. So far as is publicly known, a nominee has yet to be selected. It is known that several persons of recognized ability and stature have declined offers of appointment.

It is manifestly important that this post be filled as soon as possible, and by a person truly and well qualified to cope with its many and varying demands. There is a serious threat to the effectiveness of Patent Office operations in either extending the present period of hiatus and uncertainty, or in the appointment of a person not adequately qualified.

Prospects of filling the post soon and well would probably be substantially improved by promptly establishing the Patent Office as an independent agency. Therefore, I would suggest that the Committee might wish to consider accomplishing this by enacting such legislation, split out of S. 1321, as soon as possible.

There are also other important positions in the Patent Office now vacant, and these presumably will remain so until after a new Commissioner is appointed. Among these are the positions of Deputy Commissioner and Assistant Commissioner for Legal Affairs.

The latter position was established by a reorganization of the Patent Office which I proposed and which was approved December 15, 1972. Two days follow-

ing that approval, an administration "freeze" was imposed on all hirings. For that reason—and also because of the long consideration of my proforma resignation—it was impossible for me to fill that position, as well as other positions of great importance to the operations of the Patent Office.

Significantly, the considerations which prompted my establishing that new position were very similar to those underlying various proposals of S. 1321. I was particularly concerned to provide more effective legal input to, and guidance for, the patent examining operation; also, to provide a focal point for the coordination of legal activity throughout the Office and for the development of improved examination procedures. This position has never been filled.

The opportunity to present my views is appreciated. I hope they may prove of some assistance to the Committee in its consideration of the issues to which they are directed.

Respectfully,

ROBERT GOTTSCHALK.

ARLINGTON, VA., September 21, 1973.

Senator JOHN L. McCLELLAN,
U.S. Senate,
Washington, D.C.

DEAR SENATOR McCLELLAN: I am writing in response to your letter of September 19, 1973 in which you directed attention to the statement in my testimony on September 14 that "regularly substantial sums of money appropriated for the Patent Office are siphoned off for other uses within the Department of Commerce", in which you requested that I "furnish the Subcommittee for the record a more detailed statement concerning line item funds appropriated to the Patent Office which were otherwise utilized by the Department of Commerce," and in which you also stated that you were "requesting the Secretary of Commerce to supply the Subcommittee with a report on this matter".

As I am sure you fully appreciate, my above-mentioned statement was made in the context of consideration of the questions whether the Patent Office should be removed from the Department of Commerce and established as an independent agency, and whether the Patent Office as a part of the Department of Commerce is subject to improper or undue influence; and also, that my statement was made following, and in response to, the testimony by the General Counsel of the Department of Commerce that "...we are aware of no evidence in the history of the Patent Office which would suggest that any improper influence was exerted upon the Patent Office by officials in the Departments to which the Patent Office has been attached".

Needless to say, none of my testimony, in any part or degree, was given lightly, but rather with a full appreciation of the seriousness of the issues under consideration, and of the importance of developing all facts relevant to and necessary for their sound and appropriate resolution, including those concerning the actual disposition and use of funds appropriated to the Patent Office. Further, the facts in that regard were, I felt, essential to an accurate appraisal of the recent development in budget request practices of the Department of Commerce which I mentioned in my testimony.

Clearly, the Secretary of Commerce is in far better position than am I to furnish the detailed statement of matters in this connection which you have requested. The records and other resources of the Department of Commerce are fully available to him, whereas I do not have access to either. I have not been privy to any records or activities of the Department of Commerce since June 29; and I have no records or other sources of information to which I can refer for assistance in responding to your request.

However, I believe that I am in position to at least identify lines of inquiry which, if pursued, should lead to the development of the detailed information which I understand you are seeking. Even so, I am somewhat handicapped by several considerations, which I would briefly note as follows: My term as Commissioner was limited to 18 months, and my term as Acting Commissioner was limited to 4 months. Throughout this entire period of less than two years, I was deeply immersed in the many and varied operating and professional problems of the Patent Office. Necessarily, for the specifics involved in the handling of financial and other administrative details of Patent Office operations,

I relied to a considerable extent on my able and experienced Assistant Commissioner for Administration who joined the Patent Office from another agency in January of 1972. Nor can I claim to have mastered the special terminology employed in governmental circles to such an extent as to enable me to use, with certainty and precision, the terms which might be employed by others to describe particular transactions and events relating to financial transactions of the Patent Office and the Department of Commerce.

Having said that, let me be as direct and specific as I can.

I twice encountered the practice which I can best describe in general terms as follows. Toward the end of fiscal year 1972, and again toward the end of fiscal year 1973, the Patent Office was necessarily engaged in close and careful monitoring of the payments it made and obligations it incurred, in order to achieve the dual objectives of fully utilizing all resources made available to it, while at the same time insuring against exceeding its funds or authorizations. Toward the end of each of these two fiscal years, I recall being informed that, on orders originating with the Department of Commerce, portions of our then-remaining funds were literally transferred to, or appropriated by, the Department of Commerce for its use for non-Patent Office purposes. While I cannot state the exact sums involved, it is my recollection that in each case they were substantial. Beyond the question of the amounts themselves I was, and remain, considerably disturbed by the manner in which these transfers were effected, and by the questions of principle involved.

The same general kind of experience was also encountered in other instances which did not involve the transfer of Patent Office funds as such, but rather the utilization, at the direction of the Department of Commerce, of Patent Office personnel and facilities in pursuit of non-Patent Office objectives.

Several examples come to mind. During my tenure as Commissioner, the Administration launched a program, involving the Department of Commerce and other governmental units, to study and improve the policies and techniques involved in the development and commercial utilization of new technology. In part, this included the so-called ETIP program. The Patent Office was called upon to participate in this effort, and made significant contributions of the time and skills of some of its key personnel.

A second example concerns the effort to develop an improved Government Patent Policy. This also involved similar requests involvement and Patent Office contributions. One specific aspect of this matter concerned the activities of the interagency committee on Government Patent policy, chaired by the Assistant Secretary for Science and Technology.

A third example concerns the development of a program relating to "Technology Assessment and Forecast". This effort was incubated and hatched in the Patent Office prior to the time I became Commissioner. It was continued and expanded thereafter within the Department of Commerce, under the supervision and control of the Assistant Secretary for Science and Technology, and an "Office of Technology Assessment and Forecast" was established within the Department of Commerce. Its director was, and I believe still is, a Grade 17 employee of the Patent Office. At the time I left the Patent Office, he was continuing to devote full time and attention to that activity, which was of great interest to the Secretary and to the Assistant Secretary for Science and Technology. This program is based upon data derived from Patent Office records; and the substantial effort involved in extracting, compiling and utilizing this information has been largely provided by Patent Examiners and other highly qualified personnel on the staff and payroll of the Patent Office.

The initial publication of the Office of Technology Assessment and Forecast was issued in the Spring of 1973. The "Introduction" stated that it resulted "from a recently instituted Commerce Department Technology Assessment and Forecast Program. This program, established under the Office of the Assistant Secretary for Science and Technology, constitutes a new information source for business and industry." The publication does not purport to be a Patent Office report, nor is the program represented as being a Patent Office program.

By reference to these several examples, I do not intend to question the desirability or the importance of such activities as they represent, nor to question whether such activities represent proper matters of legitimate concern to the Department of Commerce. My concern derives from the fact that in each such instance, Patent Office involvement in these matters was directed by the

Department of Commerce, drew upon Patent Office resources, and necessarily diverted such resources from the statutory duties with which the Patent Office is charged and in respect of which it is held accountable.

As an independent agency, the Patent Office would not be subject to such demands on its resources. As an independent agency, its performance of any such functions or services would either be appropriately funded by the Congress, or conducted on the basis of appropriate reimbursement. In either case, such activities on the part of the Patent Office—which might well be in the national interest, and entirely appropriate and desirable—would not represent an unauthorized and inappropriate drain on the resources of the Patent Office, prejudicial to the performance of its statutory duties.

Finally, may I suggest that it might be desirable to attempt to develop the relevant facts with respect to what I believe is known as the "Secretary's Reserve Fund". Although my personal knowledge in this regard is quite limited, I believe I am in position to indicate the relevancy of such inquiry to the interests you have expressed.

With kind regards.

Sincerely,

ROBERT GOTTSCHALK.

[The following was ordered printed at this point in the record:]

THE SECRETARY OF COMMERCE,
Washington, D.C., October 2, 1973.

HON. JOHN L. McCLELLAN,
*Chairman, Committee on Patents,
Trademarks, and Copyrights,
U.S. Senate,
Washington, D.C.*

DEAR MR. CHAIRMAN: This is in reply to your letter of September 19, 1973, regarding certain allegations made by Mr. Robert Gottschalk, former Commissioner of Patents, during the hearing before your Senate Subcommittee on Patents, Trademarks, and Copyrights on September 14, 1973.

The first of these allegations concerned diversion to other purposes within the Department of "substantial sums of money" from funds appropriated to the Patent Office. A thorough review of our records for the period Mr. Gottschalk was associated with the Patent Office, May 1970 to June 1973, has not revealed any instance in which substantial sums of appropriated Patent Office funds were transferred to other Department of Commerce agencies, for other than Patent Office functions. Accordingly, the only conceivable explanation for Mr. Gottschalk's charge is that he imperfectly understood the process of budgetary administration within the Department during his tenure at the Patent Office and misconstrued both the purpose and the use of contingency funds in the "Secretary's Reserve." Since FY 1972, each bureau within the Department has been required to earmark at the outset 1% of its appropriation for high priority projects which were not foreseen at the time the budget was developed and presented to Congress. Towards the end of the fiscal year, funding not assigned to any priority project is released for the bureau's general use. As you can see in the enclosure all projects funded out of amounts reserved from the Patent Office budget in FY 1972 and FY 1973 were either directly beneficial to the Patent Office or had implications with respect to the patent system.

A second allegation made by Mr. Gottschalk is that, under the new Science and Technology budget for the Department instituted in FY 1974, consolidation of the Patent Office appropriation with those of National Bureau of Standards, the National Technical Information Service, and the Office of Telecommunications will be used as a means of diverting Patent Office funds to other Science and Technology accounts. I can assure you that to date no funds have been diverted from the Patent Office as a result of this consolidation, nor would I permit any unauthorized transfer to occur. I might add that Mr.

Gottschalk can certainly have no basis of experience or observation on which to justify the apprehension he expresses in this connection, since the consolidated Science and Technology appropriation did not become effective until July 1, 1973, after his departure.

Mr. Gottschalk again raised the matter of his resignation as Commissioner. I fully endorse the response General Counsel Bakke gave to Senator Hart's question on this subject in the course of the hearing on September 12, prior to Mr. Gottschalk's appearance. However, in light of the fact that Mr. Gottschalk subsequently sought an audience before the Subcommittee in which he once again aired his alleged grievance, I believe some brief further comment may serve to place the matter in proper context. As you know, Presidential appointees in the Executive branch serve at the pleasure of the President and, by extension, the pleasure of the appointee's immediate superior. Accordingly, it is tacitly understood when one accepts a Presidential appointment that his resignation may be requested at any time. It is also tacitly understood, given the dignity of such positions, that when one's resignation is requested, the request is to be honored without quibble. In this instance, Mr. Gottschalk's resignation was requested and he complied.

I should also like to comment on Mr. Gottschalk's allegation concerning "improper influence" over Patent Office matters during his tenure as Commissioner. That charge is unfounded. In this connection, a clear distinction must be made between day-to-day operations, which are properly the province of the Commissioner, and, on the other hand, policy matters for which I, as Secretary of Commerce, have ultimate authority and responsibility under 35 U.S.C. 3, 6 and Reorganization Plan No. 5 of 1950. I consider departmental participation in or review of broad policy decisions, including those having actual or potential wide impact on the application or interpretation of the patent laws, an appropriate and necessary exercise of my responsibilities with respect to activities of the Patent Office. Indeed, it is my view that the Department would be derelict in its obligations were there not to be such policy involvement by senior officials.

If I can be of any further service to you or your Committee on this matter, please do not hesitate to call upon me.

Sincerely,

(S) JOHN K. TABOR,
Acting Secretary of Commerce.

Enclosure.

DEPARTMENT OF COMMERCE

SECRETARY'S RESERVE—DETAIL OF PATENT OFFICE ACCOUNT

FISCAL YEAR 1973

Amount reserved July 1, 1972-----	\$663, 000
Projects assessed against reserve:	
Competitive assessment study of tire and aerospace industries--	-20, 000
The study determined international technological activity in these industries and can be related to Patent Data in order to more adequately assess its meaning for American industry.	
Amount returned for use by Patent Office May 2, 1973-----	643, 000

FISCAL YEAR 1972

Amount reserved July 1, 1971-----	593, 000
Projects assessed against reserve:	
Study of multi-national corporations-----	-60, 000
The study provided information on methods of transfer of technology as it affects international trade. This information is useful in determining how international patent agreements should be designed and the impact of foreign patent filing in the United States.	
Price, Waterhouse study to design production control system for Patent Office-----	-265, 000
This two phase study was of direct benefit to the Patent Office, and resulted in the implementation of PALM II, the present automated production control program of the Patent Office.	
Key punch and personnel financing training-----	-8, 000
Upgraded training of personnel in processing and finance divisions of the Patent Office.	
Departmental executive ADP program and management training-----	-11, 000
Upgraded key ADP personnel of the Patent Office.	
Development of criteria and methodology to screen Government held patents for commercial potential.-----	-75, 000
Part of funding used to support initial Battelle Institute studies of Government Owned Patents in response to March 17, 1972, Science and Technology Message of the President. The studies resulted in the Government Owned Patent Promotion program of the Science and Technology area.	
Technology assessment and forecasting using patent data, systems design, programming, processing and analysis-----	-99, 000
In response to a request from Secretary Peterson, an office was set up in the Patent Office to assess trends in technological activity as shown by Patent data. The results of these studies are to be published in semi-annual reports.	
Total, All Projects-----	-\$518, 000
Amount Returned to the Patent Office June 30, 1972-----	75, 000

Mr. BRENNAN. Prof. John Stedman.

Senator HART. Professor, would you identify yourself for the record please?

STATEMENT OF PROFESSOR JOHN C. STEDMAN

Mr. STEDMAN. My name is John Stedman and I am professor of law at the University of Wisconsin where I have been teaching for many years. One of the areas in which I have spent considerable time and given considerable attention has been the area of patent law and intellectual property. In this connection I have been con-

cerned about both the good points and the shortcomings of the patent system and equally concerned with the possible ways in which the system can be improved. For those reasons, I welcome the opportunity to appear here today.

Senator HART. I should confess on the record that we miss your continued presence upon the staff of the subcommittee so we use any occasion that we can lay hands on to get you back.

Mr. STEDMAN. I must say that the periods that I spent with the committee were some of the more enjoyable ones of my entire experience. I equally enjoy appearing as a witness.

Mr. BRENNAN. You have a prepared statement. Would you like to have that printed in the record at this point?

Senator HART. It will be printed in full at the appropriate place.

Mr. STEDMAN. I have submitted a prepared statement which I believe you have copies of. In the interest of time and of expedition I will simply attempt here this morning to summarize it rather briefly and supplement it with some brief comments if this meets with the approval of the committee?

Senator HART. It does.

Mr. STEDMAN. In approaching the bill, S. 1321, I have done so on the assumption that two important principles are involved here. Principles that I believe the subcommittee will agree to from the very fact that they have introduced S. 1321. These are, one, that the patent system is a system that is worth retaining and, two, that it is a system that is in quite serious need of some fixing up. I don't believe I need to belabor the first point. We have had a patent system in this country for almost 200 years—from the beginning of the Nation almost—and, as far as I know, with the exception of a few occasional dissidents, no one seriously suggests throwing it out.

The matter of fixing it up is somewhat more complex. It is necessary, first, that we ask just what is wrong with the system. Then, for the purposes of these hearings, the question becomes, will the proposals that are the subject of the present hearings serve to put the system in shape?

The problems of the patent system are several. Some basic changes have occurred in our whole technological structure. The subcommittee itself stated these well back in 1956 when it made the following comment in its annual report:

The industrial and technological economy of today bears little resemblance to that of yesterday. The relatively simple, easily understood and inexpensive inventions have given way to highly complex inventions that require extensive scientific training to understand and substantial experimentation and capital to develop and perfect. The garret, garage, or basement inventor to a marked extent has given way to the laboratory technician who is both scientifically trained and versed in the latest techniques of experimentation and invention. The independent "lone wolf" inventor has given way to the coordinated group activity of the research laboratory.

It becomes necessary, of course, for the system to respond to some of these rather fundamental changes, but even taking the system as it has traditionally existed, there are certain shortcomings that are crying for correction.

As I see it, these are five in number. One is the question of uncertainty as to what you have when you get a patent. After all the pro-

ceedings in the Patent Office, one still remains completely uncertain as to whether his patent is valid or not. The second is the delay that has characterized patent procedures, both in obtaining the patents and in litigating and settling controversies concerning them. Third, has been the cost of the patent system, both in terms of obtaining patents and in terms of the cost of litigation—especially the latter. Fourth, has been the inflexibility that has characterized the patent system: we are dealing with a system in which contributions may vary but in which only one single reward is given once it has been determined that a person has indeed made a substantial contribution. The fifth shortcoming is the nonharmonization of our patent system with other patent systems of the world. This is a matter of special concern at a time when more and more international technological exchange is occurring and when serious efforts are being made to achieve a considerable amount of international cooperation.

What I want to examine here are the specific proposals that are before this subcommittee and to examine them in terms of their merits and shortcomings in dealing with these fundamental problems that confront the patent system.

Five matters are the subject of discussion here: One, opposition proceedings and related matters; two, the establishment of a public counsel in the Patent Office (one and two deal with the problem of uncertainty as to validity that I have mentioned); three, a deferred examination procedure; four, maintenance fees (three and four involve the problems of cost and delay); and finally the matter of setting the Patent Office up as a separate agency, a proposal which is designed to make the system operate more independently and effectively than it has in the past.

You will note that two elements that I have suggested as problems, have been left out. One is the matter of harmonization. S. 1321 does not address itself to that particular problem, and probably this is just as well. In retrospect, it may be that some of the difficulties the Presidential Commission Report ran into arose because the Commission was trying to key the American system to the international system and this opened the way for the contention that what we were doing was selling our own good system down the river. So there is probably much to be said for saying,

Let's get our own system in shape first and then see how we can work our system into the international picture.

The other matter that is not really dealt with by S. 1321 is this question of inflexibility that I referred to. This omission is a more serious matter and one I will discuss briefly in connection with both the opposition and public counsel proceedings.

Opposition proceedings. Let me turn now to the individual proposals that are before the committee, starting with the opposition proceedings. There is no point in my attempting to summarize the provisions of the bill. We are all aware of what it provides. So I will limit my comments to my reactions and any suggestions I may have.

Let me start by saying that I feel that the opposition proceeding is long overdue. Other countries have had it for years. Granting that

opposition proceedings pose some problems at times. as far as I know no country that has such a proceeding shows the least disposition to abandon it. Our own experience—and there has been ample testimony here during these hearings as well as in other instances—indicates clearly that the ex parte procedure simply will not work satisfactorily. The Patent Office examiner simply cannot do the job alone. He needs help. There are three places where he can go for it. He can go to the applicant, and there are provisions in S. 1321 which require that the applicant give him far more assistance than he has given in the past. Those who are working with the applicant, including his attorney, must also give assistance in the form of briefs, disclosures, and so forth. Second, the examiner can go to inside help. This is what is contemplated in the public counsel proposal that I will discuss next. The third source to which he can look is the outside third party, and this is what the opposition proceeding is all about.

The probabilities, I suspect, are that an adequately operating opposition proceeding is likely to prove the most effective. There is nothing like self-interest, after all, to push a person into doing the best possible sort of a job in pressing a case, and it is the self-interested individual that is the most likely to appear in an opposition proceeding.

Two additional points are worth noting in connection with the opposition proceeding. The mere existence of an opposition proceeding is going to put both the primary examiner and the applicant on their mettle to do the best job they possibly can. If they know that within a very short time after the applicant's disclosures and the examiner's search, the matter is going to become a public record and opportunity will arise for third parties to come in and show where such disclosures were inadequate or such searches were inadequate, this is certainly going to force them, if they were at all disposed otherwise, to do the best possible and most thorough job that they can.

A second factor to consider in connection with the opposition proceeding, is the probable salutary effect upon the courts. At present, the presumption of validity which is formally on the books, is almost nonexistent and probably for good reason. The courts have had before them too many instances in which it was quite clear that there was no justification for presuming that a particular patent was valid. Courts have traditionally been unwilling to accord extensive presumptions in favor of an agency where they have not had confidence in the operations of that agency. The existence of an opposition procedure, especially if the opposition occurs but probably, even if one does not occur, is likely to result in a shift in court attitudes and enable us to get away from the distressing, expensive, complex procedures in which the whole matter of validity is tried all over again before a court. I would be the last to urge that there be a strong presumption if one is not justified, but for the reasons that I have previously mentioned, a stronger presumption would be justified as a result of the opposition procedure because there would be more reasons for believing that a patent was valid once it has been issued.

There are one or two minor points that I will mention briefly in connection with the opposition proceeding. One is the question whether it may be advisable to issue the patent first and then follow with the opposition. This would prevent the kind of tieup and delay that results from a protracted opposition proceeding of the type Commissioner Gottschalk was talking about a few moments ago. This would seem especially relevant if a patent is to run from the date of application, as is proposed by S. 1321, instead of from the date of issuance.

Second, is the question whether there should be a time limit on the opposition. It is frequently proposed that one speak up within a given period of time or forever hold his peace. The suggestion seems to me a rather doubtful one. There may be various reasons—lack of motivation, lack of information, or lack of resources—which may make it impossible for one to institute an opposition proceeding within a given time. It would seem that, if it is desirable to permit this procedure before the Patent Office within a period of 3 months, then it should be desirable within 4 months; if within 3 years, then it should be desirable within 4 years. At the same time the committee might appropriately give some thought to developing means to encourage opposers to come in as fully and as promptly as possible since this would be desirable in the public interest.

Finally, I raise the question whether the opposer should be permitted, at least at this point, to become a party. Here again, some of the difficulties of the foreign systems have been the protracted, cumbersome proceedings that result from an opposition which frustrates rather than promotes the operation of the patent system. It may turn out eventually that the procedure is not meaningful unless one is permitted to become a party, but it would seem wise to start out initially by permitting an opposer to submit information to the examiner but not permit him to become a formal party to the proceeding.

A collateral matter that I might suggest is indicated in a footnote on page 6 of my statement. That is the possibility of a procedure in which courts, with litigation before them, might at their discretion submit evidence to the Patent Office for re-examination and an expression of views in the light of newly discovered evidence—views which the court would not be bound to follow.

Public counsel. The second proposal is the matter of a public counsel. The public counsel, like the opposition proceedings and the provisions for patentability briefs, disclosures by applicants and oaths, is designed to bring out as fully as possible whatever information the Patent Office ought to have, prior to the time that the patent is granted, with respect to such grant.

The public counsel, in a sense, is playing the role within the Patent Office that a serious opposer would be playing working from outside in an opposition proceeding. Here again, the effect would be to provide a needed balance to the present one-sided *ex parte* type of proceeding and to that extent contribute to the integrity of the patent system.

I would suggest one caveat with respect to the public counsel. Since this is a new proposal, it may be wise to start out modestly

rather than giving public counsel a multitude of sweeping responsibilities as S. 1321 does. It might be preferable to limit his responsibilities to playing the role of devil's advocate rather than having him spread himself too thinly or having him get into a situation where there could be real confusion concerning his role, both in his own mind and in the minds of the patent office, the public, and the applicant as well. In suggesting that he not take on the responsibility of handling appeals and that sort of thing for the Patent Office, I do reiterate that someone other than the primary examiner should have the responsibility of defending the position that the primary examiner has taken instead of putting this additional burden on the examiner who, after all, has simply done his job in a conscientious fashion.

All in all, what I am suggesting is that the public counsel feature is a desirable thing to experiment with, but it is something that perhaps one should go slowly with and feel one's way before extending his responsibilities into broader areas than this relatively limited role.

At this point I do want to make a comment about the problem of inflexibility as it exists in the patent system. Senator. My comment relates both to the opposition proceeding and to the public counsel proposal. Both of these proposals will be useful in providing for greater certainty as far as patents are concerned. They are not going to solve the problem alone. Part of the difficulty that we have in our patent system is the fact that both the Patent Office and the courts are faced with a dilemma. With only one single reward available for a given novel contribution, namely, a 17-year exclusive right in the invention, the decision maker often finds himself confronted with a situation in which an inventor has made a substantial but not outstanding contribution, with the result that granting a patent gives him too much and denying him a patent gives him too little. In this situation there is no room for a right decision. As I expressed it 25 years ago, our patent grant is comparable to "a system in which every worker receives, say, \$10 a day, irrespective of whether he is a college graduate or an illiterate, capable of a hard day's work or a weakling, industrious or one who soldiers on the job."

There are various ways in which flexibility might be injected into the patent system: Petty patents; patents of addition; possibly some relaxation, subject to careful safeguards, with respect to double patenting and the introduction of new matter; and finally, some ways of providing more flexible remedies than we have at the present time where the whole thrust of relief is in terms of an absolute injunction. It would seem desirable to explore some of these more fully than S. 1321 has.

DEFERRED EXAMINATION

The third topic before the committee is the matter of the deferred examination. Here, we move from the proposals that are designed to enhance the integrity of a patent to proposals that are procedural and contribute to a reduction in cost and delay.

Deferred examination has been extensively debated, pro and con, for quite some time—ever since it was introduced initially in the

Netherlands. It has both virtues and vices and this suggests that it should be explored sympathetically and respectfully but also very carefully and critically. Its virtues are that it avoids a long drawn out, complicated, expensive, burdensome proceeding in the Patent Office, fighting over a patent which after it has issued, may never become the subject of any kind of controversy in any way, most frequently because no one else is interested in using the particular invention. It would be nice if all of our inventions were the subject of great economic importance but the simple fact is that they are not. Yet, every patent must be subjected to the examination procedure. This is burdensome both on the Patent Office and on the applicant. Secondly, deferred examination provides for prompt publication and expeditious disclosure and this, after all, is in the public interest. Third, it is often urged—although I think this is an unfortunate emphasis to give it—as a means of taking care of the backlog that plagues the Patent Office not only in this country but in other countries as well.

Having emphasized these good points, it is important to recognize some very real dangers. The greatest danger, of course, is that we end up with a great many inadequately conceived and inadequately formulated patents or potential patents that provide little useful and novel information and create a multitude of actual and potential barriers to freedom of use and impose heavy burdens of examination, review, and possible litigation. Secondly—although I think this danger is less important because patentees are likely to be fairly sophisticated about these matters—it may provide a pitfall for the unsuspecting. Thirdly, if inadequately administered, it could very easily result in a substantial increase in the number of applications and thus defeat the purpose of trying to reduce the Patent Office's backlog.

In light of these concerns, I would suggest, one, that initially it is important to study the experience in the Netherlands, Germany and Japan and see how the system has worked, in order to detect pitfalls that may exist and see how we might avoid these. From a procedural standpoint, the important thing is that the deferred examination be administered in a careful and responsible fashion.

My second suggestion is to urge a careful screening of applications and an outright rejection of any that are inadequate because of inadequate disclosure, clear noninvention, or any other reason, and further, to urge that the Patent Office make at least an initial prior art review and attach this to the patent so that it goes along with the patent and one has the benefit of whatever evaluation has already been made by the Patent Office.

Thirdly, it would seem advisable to permit an applicant to withdraw his application if he decides that he does not want it to issue in the deferred application form. Finally, the fees should be carefully tailored—and this would call for some doing—in order to provide fees that would be low enough to make the deferred application procedure attractive to applicants and at the same time high enough to discourage frivolous, nuisance-type applications.

All in all, if adequately and properly administered, the program could result in the publication of deferred applications of sufficient

quality that the committee might wish to consider the possibility of having the effectiveness of the application or of the patent run from the date when it is published as distinguished from the date when it is ultimately validated, subject, of course, to the patent being subsequently validated before it became enforceable.

Let me make two or three minor comments concerning the deferred application. It is worth noting that this proposal dovetails with some of the other proposals that seem to have merit. It dovetails with the opposition proceeding, with the desirability of a low initial fee, and with the defensive patenting procedure which has been used at times in the past.

Maintenance fees. Now, we come to the fourth recommendation of S. 1321 under consideration here, the matter of maintenance fees. Here again, I think the merits are fairly obvious. Maintenance fees make it possible to keep initial fees low. This is desirable in the interests of stimulating invention. Second, they provide a procedure whereby it is possible to wash out those patents that are no longer economically relevant and which would simply clutter up the record in terms of a person looking to see just what he could do and what he could not do. Third, the bill provides for a considerable amount of flexibility and waiver of fees. This is a desirable feature both in terms of making it possible for the less financially equipped applicants to make applications and also in view of the high fees that are proposed in S.1321.

Two or three of the fee provisions in S. 1321 give me concern. One, I agree with the suggestion that, rather than a yearly fee, there be a periodical fee—perhaps after the third year and then in the successive third years after the patent issues. Second, the fee that is established as a minimum appears unjustifiably high. It would discourage inventors. It would throw cold water on the fire of invention and innovation in that it makes patenting an inordinately expensive proposition. It leaves the impression that the real purpose of the maintenance fee is not to provide a soundly administered operation in which one pays low fees at the time when the patent is the least productive and higher fees later when he can afford to do so, but that the real purpose is to find an excuse for higher fees. This, I think, would be unfortunate. That brings me to the third provision with respect to the fees that gives me concern, namely is the proposal that the Patent Office should recoup from 65 to 75 percent of its expenses in the form of fees. I have always found it difficult to see any real justification for this. If one were to view the patent as a giveaway; as a grant by the government of something that a person was not really entitled to, that would be a different matter. Presumably patents are granted because the inventor has made a contribution. Under those circumstances, I see no reason, since there is a public contribution, why the public should not pay all or at least most of the cost of making the invention available. The patent system either is or is not in the public interest. If it is not, we should get rid of it. If it is, we should give it the support needed to enable it to work effectively. When one considers the total national budget in relationship to the trivial amount, relatively speaking, that goes to the Patent Office, it is hardly convincing to say that we

can not afford to give adequate support to that Office. An added concern in my mind is the fact that the very inclusion of a provision of this sort may strengthen the tendency to keep the Patent Office budget inadequate. We have heard testimony that what is needed is a really well-operating and well-supported Patent Office. The way to get that is to provide it with the money and then see that it uses that money in a wise fashion.

Finally, here again, there is a long-standing European experience with respect to maintenance fees and it would seem wise to examine carefully the experience in these countries in order to avoid any shortcomings that they may have experienced.

Independent agency. We come now to the fifth item before the committee, namely the matter of the Patent Office as an independent agency. One consideration that makes this desirable is that the Patent Office has the job of administering a law and of granting rights or not granting rights according to the law. Typically, in our system, we have not left that job to executive departments. We have left it either to the courts or to administrative agencies of the type that Mr. Browne was talking about yesterday. The other consideration, of course, is whether separation of the Patent Office from the Department of Commerce would result in better and more efficient operations. Would it carry out its job better than it can under the present structure? I have no particular knowledge on this and I simply pass over the question with the observation that anything I might say at this point following Commissioner Gottschalk's testimony would be gilding the lily.

So much for the matters before the committee. I have included in my prepared statement comment on a number of additional items, some of which struck me as good, some of which struck me as not so good. Regarding most of these, I will simply refer you to my prepared statement.

There are two items, however, that I would like to mention briefly. One is the proposal to get on with the business of mechanized searching. This has been a difficult problem and one on which little progress apparently has been made insofar as the Patent Office is concerned. The traditional methods of searching that Commissioner Gottschalk referred to are obviously essential until one can find some substitute. At the same time, however, that we continue to preserve adequate searches through traditional methods, at the same time that we make efforts to improve the classification system, it would seem clear that every effort should be made to explore and move as fast as we can into more highly mechanized procedures, provided this can be done without interfering with carrying on the day-to-day work.

The other provision that I wish to mention is the vision in section 104(a) which would limit the date of invention that any applicant could show to 1 year prior to his date of application. This has always struck me as a desirable compromise between the proposal to take the date of application as the date of invention and the other extreme, to which we go in this country, in which it is possible to go back for an indefinite and often undeterminable period of time in establishing one's date of invention.

This concludes my testimony. I would simply say in summation that I find myself favorably disposed to S. 1321. It has shortcomings. I know. It has problems and it has bugs in it. But it represents in my own opinion a courageous step and an imaginative effort really to come to grips with the kinds of problems our patent system has been faced with. It represents the kind of an approach that is necessary if we are going to restore the patent system to what it really should be. Consequently I strongly urge careful consideration of the proposals contained in it.

The task now is one of refinements, the selective retention of those features that are meritorious and the rejection of those that are bad, the revision of those features that are sound in principle but need fixing up in details, and the further study and exploration of those that may well have merit and warrant ultimate inclusion but for which an adequate foundation has not yet been laid.

I would end up with one more observation and that is to point out that on the whole the proposals that have been suggested here in the hearings today are things that are worth trying, things that can be tried and then can be scrapped with no serious or lasting damage to the patent system if it turns out they are not going to accomplish what it is hoped they will accomplish.

Senator HART. In your comment on the deferred examination system, you suggested the initial screening, preliminary review kind of approach. Others have indicated the desirability of that approach which tends, of course, to avoid some of the problems that the administration and other witnesses have cautioned of could constitute abuse if you had a deferred system. If the law was modified or if this bill was modified to include that preliminary procedure, do you have any way of estimating how much of a saving would be made from that kind of deferred system? Is there anything in your experience to guide us on that?

Mr. STEDMAN. I have no way of making a guess on that at all. I would think the real experts on that would be the patent examiners. They should be able to give you some idea of how much time is spent in the initial screening that they customarily go through and how much is spent in fighting over refinements and details and so forth and so on.

Senator HART. I was asking the staff what we have been told in connection with that by Mr. Dunn of the Patent Office and apparently we may get an estimate. Any questions?

Mr. BRENNAN. No questions.

Mr. NASH. No questions.

Senator HART. Thank you very much.

[The statement of John C. Stedman in full follows.]

STATEMENT ON S. 1321, BY JOHN C. STEDMAN

My name is John Stedman and I am Professor of Law at the University of Wisconsin Law School. One of my main teaching subjects for over thirty years has been Patent Law and related aspects of the Intellectual Property field. In this connection, I have concerned myself with both the virtues and shortcomings of the patent system and with possible means of improving its operation. We have had a patent system in this country for almost 200 years, virtually from the beginning of our nation, and its roots in Europe go back even fur-

ther. It is a system that has served us less than perfectly, but it is nevertheless a system that has served us well. Consequently, it behooves us to ask, not whether it should be thrown out and not whether it should be taken as the be-all and end-all of ultimate wisdom, but whether it can be revised and shored up to the end that it may better perform its function in the light of modern conditions. It is with these concerns in mind that I approach S. 1321.

One hears frequently the comment from both the proponents and the opponents of the patent system that the conditions and methods of invention have changed greatly since the patent system was created; that the emphasis on the individual inventor has given way to the cooperative research of the industrial and governmental laboratory; that the complete self-containing invention of the "snapshot" type, springing full armed from the head of Jove, so to speak, has given way to the continuing process of development in which each individual step is comparable to a single frame in a movie film strip; and that primary reliance upon the stimulus of private competitive gain—to which the patent system is inextricably keyed—has given way to Government support and subsidy. This Subcommittee expressed it well in 1956 when it said (Sen. Rept. No. 1464, 84th Cong., p. 15):

"... the industrial and technological economy of today bears little resemblance to that of yesterday. The relatively simple, easily understood and inexpensive inventions have given way to highly complex inventions that require extensive scientific training to understand and substantial experimentation and capital to develop and perfect. The garret, garage, or basement inventor to a marked extent has given way to the laboratory technician who is both scientifically trained and versed in the latest techniques of experimentation and invention. The independent 'lone wolf' inventor has given way to the coordinated group activity of the research laboratory."

Granted the truth of these observations, it does not follow that the patent system is outmoded. As the saying goes, "The more things change, the more they remain the same." Changing circumstances do, however, suggest the need for close reexamination to see whether corresponding changes in the system are needed to make it work better. And that, as I understand it, is what S. 1321 is all about.

Let me turn without further ado to the problems that currently beset the patent system and the provisions of S. 1321 that are proposed as a means of coping with these problems—or, more specifically, to those particular changes to which the present hearings are addressed—and then ask whether these proposals offer tenable and viable solutions.

S. 1321, as I read it, has both good and bad points. On the plus side, speaking generally, it attempts in a number of respects to come to grips with some of the more serious problems that beset the patent system, and provides solutions for some of these problems or at least a good starting point for arriving at solutions. In doing so, it avoids some of the inadequacies and shortcomings of the predecessor revision bills that followed the Report of the Presidential Commission. On the negative side, its shortcomings, as I see it, are three-fold: One, in certain respects it seems to impose unwarranted and unnecessary burdens on patent applicants and patentees. Two, certain proposals, although they may ultimately prove meritorious, seem sufficiently uncertain in their effects as to call for more thorough investigation and research into their impact before pushing ahead with legislation. Three, even with all the new features contained in the bill, it lacks certain additions that could contribute considerably to the workings of the system.

In the remainder of my testimony, I will attempt to spell out the basis for these observations.

The first step, obviously, is to ask what are the problems of the patent system. By-passing the problems that stem from the basic changes previously mentioned, five main problems exist, as I see it, even taking the system in its traditional operation. One is the failure of the system to provide the patent holder with firm assurance that the patent issued to him will ultimately stand up. The second is the delay in processing one's claim to patent rights, both at the application stage and in later litigation. The third is the cost that attends these proceedings, again, at both the application and prosecution stages—espe-

cially the latter. A fourth problem is the arbitrariness and inflexibility of an "invention" or "non-obviousness" test which draws a sharp line between "reward" and "no reward" instead of recognizing that gradations exist in the creative process, and that there is need for a form of reward that is better keyed to the level of ingenuity—what the patent author, Emerson Stringham, used to refer to as "inventive-level." This is closely tied to the first problem of uncertain validity and will be discussed as part of that issue. The fifth problem is the need for international harmonization, a need that becomes more insistent as international transactions expand and the movement toward international procedural cooperation gains strength. This problem, I pass over inasmuch as S. 1321, in contrast to the original Commission Report and initial legislative proposals, gives it no serious attention.

Let me turn now to the five specific features of S. 1321 that, I understand, are the central subjects of the present hearing, and discuss them in the light of the major problems of uncertainty, delay and expense that I have mentioned. These five features involve (1) opposition proceedings and related means of bringing to Patent Office attention evidence relating to validity and especially evidence concerning prior art; (2) the establishment of a Public Counsel in the Patent Office; (3) a deferred examination procedure; (4) maintenance fees; and (5) creation of the Patent Office as an independent agency.

1. OPPOSITION PROCEEDINGS

Section 135 of S. 1321 provides for an opposition proceeding whereunder any person may submit to the Patent Office evidence bearing upon the patentability of a claimed invention. Thereupon, the examiner shall reexamine the application and the question of patentability in the light of the evidence thus submitted. As written, section 135 permits the opposer to remain unidentified or to become a party at his election, and permits him to submit *any* information bearing upon patentability without limiting him to specific categories of evidence such as printed publications or issued patents. Opposition must be instituted after publication of the application pursuant to section 122, but prior to notice of allowance of the patent. Section 138 provides that an opposer shall not be estopped, as a result of his action, in subsequent court proceedings.

An opposition proceeding of some sort is long overdue in our law. Other countries have had it for decades and presumably find it desirable, on balance, since there appears to be no disposition to do away with it, as far as I am aware. Experience has demonstrated that the *ex parte* examination procedure to which we have been dedicated simply does not work. The large number and proportion of issued patents that are subsequently invalidated through court proceedings is ample testimony to this fact. Procedures that permit the issuance of patent after patent that never should have issued are unfair to the public, unfair to would-be users of the technology in question, and unfair to the patentee himself. It is inefficient, expensive and discrediting to the patent system as an institution. Nor, as a realistic matter, does there appear much chance of the situation improving as long as we persist in a purely *ex parte* procedure. The Patent Office examiner cannot do the job alone. He must have some help in reviewing the application and the relevant prior art. This help can come from the patentee himself, in the form of the patentability brief and other obligations of disclosure, as provided in sections 112, 115 and 131. It can come from specially-appointed officials who are charged with responsibility for critically reviewing applications in the light of relevant prior art, such as the Public Counsel provided for by section 3(d) and which I will discuss later. Both of these innovations should prove helpful. The most effective help, however, is likely to come from interested third parties as contemplated by the section I am now discussing. Through this proceeding, the Patent Office examiner may be made aware of information that was available but which he overlooked, relevant prior art that he had no means of locating through his own efforts, and analysis and evaluation that may be helpful to him even with respect to evidence that he did possess. In short, effectively administered opposition proceedings could be of considerable help even to the most competent and conscientious examiner.

The procedure may have two additional effects, both salutary in terms of a satisfactorily operating patent system. First, the mere existence of an opposition proceeding should put the examiner (and the applicant in the preparation of his patentability brief, as well) on his mettle since he knows that, in con-

trast to present proceedings, there is a strong likelihood that any shortcomings or slip-ups of which he may be guilty will promptly come to the attention of Patent Office officials. Second, as a result of improved examination procedures and, for that matter, as a result of the sheer fact that the opportunity to oppose exists, the presumption of validity in later court proceedings should be substantially strengthened.

Certain specific provisions call for comment. If the provision for publication of the application prior to allowance is deleted—and in my opinion it should be—section 135(a) will require revision. The question then would be whether to publish the application for opposition after tentative allowance but before issuance, or whether to issue and then permit an opposition. Since experience in other countries indicates that opposition proceedings are sometimes misused as a device for tying up and delaying enforcement proceedings by a patentee, the latter would appear to be preferable, especially if the present law is amended to make patents run from date of application instead of date of issuance.

With such change, the question would also arise whether a time limit should be set for instituting an opposition proceeding. A statute of limitations of some sort has often been suggested but, on balance, it would seem preferable not to set time limits. Situations arise in which a potential opposer does not have sufficient information, resources, or interest in contesting, as to warrant his filing an opposition within a given period.

In the interests of expedition, however, the Subcommittee may wish to consider possible means of encouraging prompt opposition, short of an absolute requirement that it be brought within a given period.¹

Finally, there is the question whether an opposer should be permitted to become a party to the proceeding. Section 135(d) permits this. So do the opposition laws of other countries. It may be that experience will demonstrate that opposition proceedings cannot be meaningful without such participation, but initially it would seem desirable to try a more limited approach in the interests of minimizing expense, delay and procedural complexity, namely, of permitting an opposer to submit his evidence for consideration, making that evidence a part of the file (without identifying the opposer unless he consents), but not permit him to become an actual party.

2. PUBLIC COUNSEL

Section 3(d) provides for a "Public Counsel" whose function is to "assure an advocate, and through the adversary process, that high quality patents which meet the statutory and constitutional criteria therefor issue from the Patent Office." In this role, he is free to participate in any Patent Office proceedings in which a public interest appears to be involved. In addition, a somewhat obscure provision provides that he "shall prosecute or defend appeals from any final action of the Patent Office." Section 3(d) is implemented by section 24 giving the Public Counsel authority to issue and enforce subpoenas, by section 132(a) under which a primary examiner may request the Public Counsel to intervene in examination proceedings, by section 134(a) making him "responsible for briefing and arguing" cases (presumably in support of the Patent Office rejection, although the section does not say so expressly) before the Board of Appeals, and by sections 143 and 145 giving him comparable responsibilities on reviews of Patent Office rejections by the Court of Customs and Patent Appeals and the District Court for the District of Columbia.

The creation of a Public Counsel, like the opposition proceeding (and, for that matter, provisions not discussed here relating to patentability briefs and disclosure statements, inventors' and applicants' oaths, statements by counsel for applicants, and putting the burden of proving patentability upon applicant), is designed to reduce to the minimum the possibility of a patent issuing that should not issue. The Public Counsel, in short, plays the role primarily within the Patent Office that a serious opposer would play, working from outside, in an opposition proceeding.² Thus, to the extent that he performs effec-

¹ Although not presently in S. 1321, the Subcommittee may wish to consider an extension of the opposition principle by authorizing courts handling patent litigation to submit questions of validity to the Patent Office for consideration in the light of subsequently developed evidence.

² For that matter, it would appear that under section 135 he could himself institute an opposition proceeding, in addition to his internal operations, just as could any other member of the public.

tively, he helps to provide a needed balance to the one-sided, ex parte nature of present proceedings and to that extent contributes to the integrity of the patent system in the same sense that a well-administered opposition proceeding does.

In supporting this innovation, however, some cautionary comments are in order. The principal task of the Public Counsel is, and should be, to play the role of devil's advocate, to say why a patent should *not* issue on a given application. Recognizing that applications now run at the level of 100,000 a year, merely reviewing pending applications and taking positions on those calling for action on his part, even though this latter function is carried out on a highly selective basis, could prove a massive undertaking. To impose duties upon the Public Counsel that go beyond this specific role would in all likelihood result in either spreading the work of his staff so thin as to render its performance inadequate or creating within the Patent Office a new department of massive and cumbersome proportions. And even if workable in other respects, serious confusion of roles (confusing to the public, the Patent Office staff and the Public Counsel himself) could result from simultaneously or successively playing such somewhat varied roles as defender of the public interest in quality patents and defender of examiner action on appeal.

Here, in short, it would seem wise to proceed slowly with this novel and experimental arrangement, by holding the Public Counsel's function to the devil's advocate role, and trying it out in this limited area before broadening out into other fields.

It would be inappropriate to leave the two proposals heretofore discussed, both of which are designed to provide greater assurance of validity with respect to an issued patent, without mentioning one other cause of our present difficulties in this respect. Improvement in the procedures for determining and evaluating the prior art will help greatly in preventing the issuance of spurious patents, but it will not completely solve the problem. Those who must pass on the validity of patents, whether the Patent Office or the courts, find themselves impaled on the horns of a dilemma. With only one single reward available for a given novel contribution, namely, a 17-year exclusive right in the invention, the decision-maker often finds himself confronted with a situation in which an inventor has made a substantial, but not outstanding, contribution, with the result that granting him a patent gives him too much and denying him a patent gives him too little. In this situation, there is no room for a "right" decision in terms of what the patent system seeks to accomplish, namely, a reward or stimulus that is appropriately keyed to the contribution or effort. As I expressed it twenty-five years ago, our patent grant is comparable to

"a system in which every worker receives, say, ten dollars a day, irrespective of whether he is a college graduate or an illiterate, capable of a hard day's work or a weakling, industrious or one who soldiers on the job." (Invention and Public Policy, 12 Law & Contemporary Problems, 649, 668 (1947)).

As long as this situation continues, decision-makers are going to differ as to whether they should give too much or too little, no matter how complete the evidence of prior art and analysis of the inventive contribution may be. The answer, of course, is to inject a flexibility into the patent system that its present "one-price" system lacks. There are various ways to do this. Petty patents, patents of addition, some relaxation of the double-patenting rule, tailoring of claims, and selective variations in the scope of relief granted, immediately come to mind. Unfortunately, S. 1321 is silent on this point. Before it is through, the Subcommittee may wish to give some thought to this aspect of the patent problem.

3. DEFERRED EXAMINATION

In the foregoing discussion of opposition proceedings and the Public Counsel, the primary concern was to improve the integrity of the issued patent. The remaining points to be discussed center on the procedural and structural aspects of the system, especially as they affect the cost and delay in obtaining and enforcing patents.

The first of these to consider is the proposal for deferred examination. Sections 191 and 192 provide that an application shall, unless applicant requests immediate examination at the time he files, be published following an examination "as to formal matters and other such matters as the Commissioner may prescribe." Thereafter, within a period of 5 years, a request for examination

may be filed by applicant, Public Counsel or any other person who is prepared to pay the examination fee. If no request is filed within 5 years, the application lapses. Although the bill is not explicit on this score, no enforceable patent rights apparently arise until such examination occurs and the Patent Office formally "issues" the patent (section 151). Section 153(b) provides for extension of the patent term (which, under S. 1321, begins to run as of date of application) by the period of deferment, so that the period of enforceability will not be less than it would have been had there been no deferment—indeed, under section 153(b) as phrased the term might be lengthened to some extent.

The concept of deferred examination has virtues, but it also has vices. Consequently, it should be explored sympathetically and receptively, but also carefully and critically. Its main advantages are that it relieves both the applicant and the Patent Office of the burden, expense and delay of extensive controversy over the details, in terms of both validity and scope, of an application—controversy which may ultimately prove to have been a waste of time because no third party shows sufficient interest in the invention either to challenge it or negotiate rights under it—a fate that apparently befalls a substantial proportion of issued patents at the present time. Deferred examination also means more expeditious disclosure, resulting in benefits to the public generally. A marginal advantage, but unfortunately one that appears to have received undue emphasis in the moves to introduce deferred examination, is that it would help reduce the backlog that typically plagues patent offices, our own included.

The dangers of a deferred examination are that, improperly administered, it can let loose on the patent a spate of inadequately conceived and inadequately formulated patents or potential patents that provide little useful and novel information and create a multitude of actual and potential barriers to freedom of use, and impose heavy burdens of examination, review and possible litigation upon would-be users. It can also prove to be a pitfall to the unsuspecting applicant who finds his idea publicly disclosed, but is ultimately denied a patent and ends up with nothing as a result. Finally, to the extent that applications are encouraged that otherwise would not be filed, the effort to clear up the backlog may prove self-defeating.

In the light of these considerations, it would seem wise to proceed with the idea, but to do so cautiously. Initially, the experience of those countries, spearheaded by the Netherlands, that have instituted a deferred examination procedure should be studied and the present proposal reexamined in the light of what that study discloses. In exploring possible modifications of the present proposal, the Subcommittee might give thought to the following possible considerations: (1) providing an initial screening, though short of a full examination, that would deny even a provisional issuance of any application that failed to meet standards of clear, full and adequate disclosure or involved only an idea that would be clearly unpatentable by patent law standards; (2) undertake at least a preliminary review of the prior art and append to the issued application a statement and evaluation thereof so the public (and the applicant) would have some idea of the nature and extent of the contribution and consequently the probabilities as to validity; (3) permit the applicant to withdraw or modify his application at any time prior to issuance so as not to lose such possible trade secret rights as he might possess; and (4) develop a fee structure that would be high enough to discourage frivolous or nuisance applications and at the same time low enough to provide applicants (and, collaterally, the Patent Office) with genuine benefits from the procedure—a delicate and difficult balancing act, I concede, but not an impossible one.

A deferred examination procedure that embodied the foregoing conditions should result in issuances of sufficiently probable validity that it would be appropriate to have legal rights under the patent begin to run from the date of issuance—contingent, of course, on the patent being subsequently validated—instead of running only from the date of validation.

Before leaving this subject, let me make briefly four additional observations. (1) The deferred examination procedure fits in with the concept of an opposition procedure, and complements that procedure, in that opportunity exists for third parties to provide the Patent Office with evidence and argument as to why a patent should not be valid. (2) The procedure also fits in with the concept, to be discussed next, that the fees charged an applicant should be as

light as possible at the beginning when the return from the invention is small and its value conjectural, and increase later if and when the invention proves its worth. (3) It also fits in well with the concept of defensive patenting which has operated in some measure in recent times. (4) Although there is currently under consideration a voluntary semi-opposition procedure that would partially perform the function that the deferred examination and opposition procedures of S. 1321 contemplates, it would seem preferable to write these into the statute rather than leave them to the legal and operational uncertainties that necessarily attend a voluntary, nonstatutory procedure.

4. FEES, INCLUDING MAINTENANCE FEES

Section 41 of S. 1321 provides for a fee structure that departs in several respects from present law. One, it leaves the setting of specific fees to the Commissioner, except for putting a ceiling (of \$100 for each fee) on initial fees and on the maintenance fees charged during the first three years, and a floor (of \$1000, increasing by 15% a year) on maintenance fees beginning with the fourth year. Two, as just indicated, it provides for small initial fees and a small maintenance fee during the early years and a very substantial annual maintenance fee thereafter, with a provision for waiver if the patent is surrendered within four years after issuance, and for some deferment of fee payment, up to ten years under certain circumstances. Three, the Commissioner is empowered to grant substantial exemptions (up to 50% of regular fees and up to 80% of maintenance fees) to individual inventors and small businessmen. Fourth, fees are to be set on a basis that will make the Patent Office 65-75% self-sustaining.

Some of these provisions have considerable merit, at least in principle. As previously stated, a policy of keeping costs low at the stage when the invention is producing little or no income—especially since these Patent Office fees follow hard upon the heels of the bulk of one's research expense and professional fees—and then offsetting the early low charges with higher charges later, seems sound both as a matter of equity and as a means of maximizing inventive stimulus. This is what the maintenance fee structure does, in addition to providing an effective means of washing out those patents that prove to be of no enduring economic significance—a sort of street-cleaning job. The soundness of the approach is suggested by the fact that most other countries have a long-standing maintenance fee system and show no disposition to abandon it. The concept of providing special concessions in hardship cases, typically cases involving individual inventors and small businessmen, also appears sound. It would seem preferable, however, that some body more experienced in these matters than the Commissioner of Patents, such as the Small Business Administration, be given the job of processing these cases and that decisions be based on equities and hardship rather than on whether one is a large or small concern, an individual or a corporation.

My main reservations concerning the proposed fee structure are three-fold: (1) Because of the administrative burden and chances for slip-up involved, it would seem much better if maintenance fees were to be omitted during the early years of the patent—say, the first five years after issuance—and then assessed only periodically, perhaps every three years thereafter.

(2) The maintenance fee schedule that would apply after the third year strikes me as seriously out of line, both in terms of the disproportionate charge as compared to the cost of processing patent applications and in terms of the cold water it throws on the fire of invention and innovation. It seems to suggest to the inventor and those in privity with him that his patent is an unwanted evil and that everything possible will be done, once he has obtained it, to force him to get rid of it. This seems hardly the way to achieve the Constitutional purpose of promoting the progress of science and useful arts through the grant of patents. Furthermore, it leaves the impression that maintenance fees are being used as a cover-up to collect much higher fees instead of being used in the legitimate fashion for which they should be used.

(3) Granted that there exists a long-standing tendency to think of the Patent Office as an institution that should be entirely or substantially self-sustaining—indeed, the Patent Office itself embraced that attitude not too many years back—the principle does not hold up well under close examination. Either the patent system is in the public interest or it is not. If it is not, we

should get rid of it. If it is, as the Founding Fathers and most of their progeny have firmly believed, we should give it the support needed to enable it to work effectively. Certainly, considering the nature and extent of the modern federal budget, any contention that we cannot afford to do so is singularly unconvincing. This is not to say that the patentee should pay no fees at all or only nominal fees. It is only fair that he should pay his way to some extent. Furthermore, fees should be high enough to make the applicant ask, "Is this trip necessary?" It is to say, however, that Patent Office fees should not be used to make money on the patentee, and further that they should not be so high as to drive inventors out of the market. These observations become all the more relevant considering the fact that as inventions become more complex, applicable art more voluminous, and the collection of relevant data more thorough, processing costs are likely to go higher rather than lower. It seems somewhat anomalous and inconsistent with the "stimulus" theory that underlies the patent system to box ourselves into a situation in which the more effective we become in screening out patents that should not issue, the more we charge the patentee in case one does issue.

One last word concerning maintenance fees. Like opposition proceedings, such fees have a long history in Europe, as I have previously mentioned. As a prelude to their introduction here, a careful study of their operation elsewhere should be made, so that we can profit from the experience of other countries.

5. THE PATENT OFFICE AS AN INDEPENDENT AGENCY

Section 2 of S. 1321 sets up the Patent Office as an independent agency. My comments on this proposal will be very brief.

The primary function of the Patent Office is to pass upon patent applications, a quasi-judicial responsibility. In discharging this responsibility, it would seem desirable that the Office operate independently of the Executive departments, such as the Department of Commerce.

S. 1321 does contain some provisions designed to perform services to the public (see, for instance, sections 6(a) and 8(f)), which might appropriately be left to the Department of Commerce if this were deemed desirable provided unnecessary duplication and loss of efficiency could be avoided. What effect separation from the Department of Commerce would have in terms of personnel, operating efficiency and budgetary considerations, is a matter on which I do not feel qualified to comment, but it is hard to see how the interests of the Patent Office and its efficient operation could be hurt by such a move.

6. MISCELLANEOUS PROVISIONS

The foregoing comments complete my testimony on the points to which, as I understand it, the Subcommittee wished to direct its attention in this set of hearings. There are, of course, many other features of the bill that are of considerable significance, some of them salutary, some of them not. There are also certain provisions which might well have been included, but were not. I will not attempt here to do anything more than merely list some of these items, but if the Subcommittee should be interested at a later date in exploring them and others, I will be glad to develop my views in more detail at that time.

a. Miscellaneous items of a salutary nature

Among the provisions in the bill that strike me as desirable, granted that some of them may need revision of sorts, are the following:

(1) Section 6(e) calling for both research and development in the area of mechanized searching. (Recognizing that sporadic efforts have been made and are currently being made by the Patent Office to develop competency in this area, and recognizing also that serious problems arise in using mechanized searching effectively, increasing reliance upon such methods seems both inevitable and indispensable to adequate performance in future patent administration. Indeed, a time could come when the test of what constitutes prior art will be determined by what comes out of the computer. Consequently, we had better be getting on with the business, and a mandate to the Patent Office from the Congress to this effect would seem quite in order.)

(2) Provisions designed to give greater assistance and service to the public, exemplified by sections 6(a), 6(d) and 8(f).

(3) The provisions of section 147, giving the Court of Appeals of the District of Columbia jurisdiction to review decisions of the Court of Customs and

Patent Appeals. (One may grant the high level of sophistication and competency in patent matters that exists in the CCPA. At the same time, the anomaly of the comparable District Court proceeding being subject to intermediate review while the CCPA proceeding is not, the fact that ways are being sought to reduce the burden on the Supreme Court by providing more intermediate appeals, the recognition that historically the CCPA was set up to assist the District Court, and finally, the difficulties that arise when the CCPA and the Court of Appeals take inconsistent positions, as they have done now and then, all suggest the desirability of at least exploring this proposal carefully and receptively.)

(5) The provisions of section 104(a) setting a one-year limit on the pre-application activities that one can invoke in establishing one's date of invention. (The considerations that, in my opinion, make this provision desirable are set forth in considerable detail in a talk I gave in 1971, published in 2 I.I.C. 241 (1971), a copy of which is attached. This provision in section 104(a) is implemented by the provision in section 112(a) requiring the applicant to set forth in his specification the invention dates upon which he intends to rely.)

(6) The provision in section 112(b) requiring specific disclosure of just what the invention covers. See also section 104(c). (Cf. *Guide v. Desperak*, 144 F. Supp. 182 (SD NY 1956)).

b. Miscellaneous items of a doubtful nature

On the other hand, S. 1321 contains a number of provisions that are of questionable merit, at least in the light of present knowledge. It may be that more thorough research would show a need for the provision or some modification thereof, but inclusion at this stage seems inadvisable in the absence of such a showing.

Among these proposals are the following:

(1) The inclusion in sections 102(a) and (b) of foreign public use and sale as relevant prior art. (Some modification of this provision, e.g., use or sale which is actually known in the United States, or knowledge of which is reasonably and readily accessible, might ultimately be desirable, both because of its relation to applicant's actual public contribution and because it would constitute a desirable step toward international harmonization. In its present sweeping form, however, the proposal could create an almost insuperable barrier to a firm finding of validity and enormously add to the burdens and cost of litigation.)

(2) Section 112(a) requiring the disclosure of "all know-how known to the inventor," if the provision is interpreted as going beyond the present requirement of adequate disclosure.

(3) Section 153, reducing the term of a patent to 12 years from date of application.

(4) Section 286, reducing the statute of limitations to 2 years.

(5) Section 122 providing for publication of applications, and related provisions such as section 134 which makes proceedings before the Board of Appeals public.

(6) Certain provisions that arbitrarily limit the area of patentability, such as the provision in section 104(e) barring patents based upon the perception of a problem, the provisions of section 201(c) barring broadened reissues, and section 203(c) blocking the "terminal disclaimer" solution to the double-patenting problem. (These provisions appear unduly sweeping in their application and, in my opinion, should either be modified or the law left standing as it is at present.)

(7) Section 263, which guarantees compensation to employee inventors in addition to regular salary. (While this section addresses itself to a problem with which Congress properly should concern itself, the issue is one that does not involve the operation of the patent system as such. Consequently, its inclusion in the patent statute strikes me as inappropriate. In this respect it is comparable to the antitrust and Government patent policy issues—a matter to be handled separate from the patent law revision.)

So much for the miscellaneous provisions. As I pointed out previously, the foregoing lists of supported inclusions and suggested deletions by no means cover all the features in S. 1321 that call for comment. Rather, they constitute a selective list of those items that I would single out at this point for special attention, leaving other matters for the future.

7. CONCLUSION

In concluding, let me emphasize again the need for coming to grips with the serious problems that beset the patent system. S. 1321 is to be commended for attacking the issues with courage and imagination. Inevitably, in doing so, shortcomings and inadequacies occur. S. 1321 has its share of such shortcomings, many of which I have pointed out, as have others, in the course of these hearings. The task now is one of refinements, the selective retention of those features that are meritorious and the rejection of those that are bad, the revision of those features that are sound in principle but need fixing up in details, and the further study and exploration of those that may well have merit and warrant ultimate inclusion but for which an adequate foundation has not yet been laid. (In this connection, the Subcommittee might well consider reestablishment of the research program that it sponsored for several years beginning in 1955 and which resulted in the publication of 30 monographs that shed light on various aspects of the patent system.)

In broad terms, what is called for is an approach that accepts the basic principles of the patent system, seeks to correct such shortcomings as may exist in it and proceeds with determination to do this, but at the same time proceeds carefully, thoughtfully and cautiously lest we run the risk of throwing the baby out with the bath water. It is in this spirit that I have approached S. 1321 in my testimony this morning. I hope my comments prove helpful.

Senator HART. We are not going to break for lunch if at all possible but let me suggest a five-minute recess here.

[Recess.]

Senator HART. The committee will be in order.

Mr. BRENNAN. The next witness is Dr. Howard Forman, who is appearing on behalf of the National Association of Manufacturers.

Senator HART. Dr. Forman, you are welcome.

**STATEMENT OF DR. HOWARD I. FORMAN, ON BEHALF OF THE
NATIONAL ASSOCIATION OF MANUFACTURERS; ACCOMPANIED
BY REYNOLD BENNETT, VICE PRESIDENT FOR INDUSTRIAL
INNOVATION**

Dr. FORMAN. Thank you, Senator. We have a prepared statement which I would like to have introduced in the record.

Senator HART. It will be in full.

Dr. FORMAN. May I just introduce myself, by the way, giving my qualifications as is normally done?

My name is Howard Forman. I am a patent and trademark attorney of some 30 years' experience. Roughly the first half of my experience was with the government, with the Department of the Army, and the latter half with Rohm and Haas Co., one of the country's major chemical manufacturers. For reasons which will become apparent later and pertinent to one of the issues to be discussed here, I will mention that in addition to my science and law degrees I have a Master's and a Doctorate in Business and Public Administration from the Wharton School of the University of Pennsylvania. For some 7 years I taught at the Temple University School of Business and Public Administration, a graduate course which was named Federal Administrative Process.

Now, Senator Hart, on behalf of the National Association of Manufacturers, I wish to express appreciation for the opportunity to present its views on the proposed critical patent law revision matters being considered at this hearing.

As you know, the NAM is a voluntary association of business concerns of varying sizes and commercial activities located in every State of the Union. Participants in NAM membership are companies and individuals involved in the scientific and technological endeavors that have enabled this Nation to earn the reputation as a leader in providing a climate for creativity which has enabled the development of some of the most important products and processes utilized today.

Senator, in your introduction to the S. 1321, which I found extremely interesting and provocative reading, there were two passages in particular I thought so cogent that I would like to repeat them at this point. I will quote your words: "Last year, President Nixon recognized the importance of a viable patent system, saying that 'a strong and reliable patent system' is an important predicate to United States technological progress and industrial strength." I completely agree with those words.

That is the end of one of your statements. In the other passage you say: "Mr. President, as I said, I know that discussion of patents can be tedious." Parenthetically, Senator, I think I have to agree. Then you continued: "However, I am sure that most members of this body would agree with President Nixon that we must have a strong and reliable patent system in order to promote invention and the public interest. It is a matter not only of life style and comfort for each of us, but of health, employment, and maintaining our technological superiority." Then you go on to say that revitalizing the patent system is a necessary prerequisite to restoring public confidences and allowing it to perform its constitutional objectives.

For these words, Senator, NAM salutes you and President Nixon, and personally I must say that I agree with both of you wholeheartedly. I feel that certainly the patent bar also salutes you and the President, and I trust the public at large agrees with you in those expressions of your views. The real question, though, is "how." How can we bring about the things that you have proposed?

We agree with you as to some of the answers that you have spelled out in S. 1321, but not with all.

Now the announcement of these hearings invited comments on five specific topics and accordingly I will briefly cover all five subjects and then, if you like, would be pleased to answer any questions as best I can. The first one is relative to public adversary proceedings. NAM views with optimism the prospect of improvements to the administrative procedures in the Patent Office which will enhance the validity of issued patents. Specifically, it supports involvement of third parties in calling attention of the Patent Office to any prior art relative to a claimed invention. However, NAM is not in favor of the particular procedures that have been spelled out in S. 1321.

At this point let me just depart from my written statement, and briefly recite some pertinent background information. I can recall some 20 or more years ago when I first heard a suggestion—it was espoused by a gentleman named Mr. Manuel Rosa, who was an official in the Patent Office, and I believe he is deceased now—that there was needed what amounts to an ex parte opposition proceeding in the Patent Office. This is essentially what you have in S. 643 of

the last Congress, it is contra to the system that you have been hearing and talking about here the past few days, namely the system in Germany and Japan which is a full blown inter partes procedure.

Mr. Rosa's idea was apparently before its time. The patent bar criticized it because of the experience in Great Britain where, if art is cited by anyone after allowance and publication of an application, the examiner gives the applicant the opportunity to amend his claims so as to get around the cited reference. It took two decades of debate and maturity of the proposal's critics to see in it the tremendous potential it possesses for giving real meaning to the statutory presumption of validity which a patent is supposed to have upon issuance by the Patent Office. The President's Commission on the Patent System, in its 1966 Report's Recommendation XI, urged that an ex parte opposition be legislated into our patent practice and procedure. I might add that I was so convinced of the merits of Mr. Rosa's proposal, when the President's Commission invited suggestions for revision of our patent laws I wrote it a 3-page letter describing the proposal and urging its adoption. It was, by the way, the only suggestion I felt moved to make to the Commission.

Ex parte opposition is a sensible, practical form of adversary procedure. With a minimum amount of delay in the proceedings, the whole world literally has an opportunity to aid the examiner or others in the Patent Office who may be assigned to review the art thus cited after allowance of the application. It is quite different from and avoids all the ills of the inter partes type of adversary procedure, and I say this based upon years of considerable personal experience with that type of procedure in Germany and Japan. It is quite obvious that inter partes oppositions are dragged out incessantly by permitting third parties to cite new references and new arguments against patentability ad nauseum. This is such an expensive procedure that only the wealthy individual or corporate applicants can afford it. Not only that, but the practice is counter-productive in the sense that it permits a cloud to hover over prospective patents for long periods of time during which the public, as well as the parties to the proceeding, are left in considerable suspense, not knowing whether to invest or avoid investing in the invention or some related development that may be unique to some extent but which still may be affected if the patent under opposition ultimately should issue. This is particularly vile if the parties to the opposition have no intention whatsoever to do anything else but harass and delay the issuance of the patent. I can tell you of one instance in which my company had a very important matter in Japan that caused me to go to that country to try to straighten it out. It had gone on for 10 years and involved no honest-to-goodness attempts to reach a decision before we were able to force an end to the proceeding by demanding a showdown in the courts. We have had them that long in Germany, too.

Now this type of harassment is bad enough where it affects corporate activities, but presumably they can afford to put up with the delay and heavy expenditure. The independent inventors however, are going to be put out of business by that sort of proceeding. They cannot afford to put up with delays of that type and the legal and

other fees that have to be paid to defray the expenses. Not only that, but from my own observations and experiences, I seriously doubt that you could end up with a better result, a better product, a more bona fide valid patent by having an inter partes proceeding, than you could with an ex parte proceeding. Again, providing that the ex parte proceeding was carried out along the lines which are bound to produce the results that you and we are seeking, I feel that it would be much superior and result in greater overall benefits than an inter partes proceeding.

Commissioner Gottschalk earlier today made reference to a procedure which the Patent Office is about to entertain. Actually, the hearings have been published in the Federal Register and they will be held on October 31. The subject of those hearings have been given the title of Voluntary Protest Proceedings. NAM is fully in favor of that type of adversary proceeding. Personally, I am strongly in favor of it, too. As a matter of fact, I believe I was instrumental in having it come to the attention of the Patent Office. Over a year ago, under the auspices of the American Patent Law Association, a special committee was established to consider problems involved in patent practice and procedure, and periodically the recommendations of this committee were funneled to the Commissioner for his consideration. Last January I happened, by letter to our chairman, to propose that the Patent Office should administratively adopt this type of voluntary ex parte opposition procedure, so in saying I am definitely in favor of it, I am in effect doing no more than endorsing my own proposal.

Now what is the voluntary protest procedure? It is essentially going to be very similar to that which is in or has been in section 191 of S. 643, of the last Congress. The only difference is that it will be voluntary, whereas S. 643 would have made it mandatory. In view of this possibility of administrative adoption, why adopt the complicated adversary procedure by legislation called for in S. 1321 until we have had a chance to test that voluntary procedure? I am in full hopes that after the hearings are held next month, they will be adopted and implemented administratively.

I trust you are familiar with the way this will work. The only difference between it and what was in S. 643 is that, in the absence of legislative mandate, it makes it possible for an applicant to voluntarily submit his application upon issuance for re-examination so that the whole world can come in and cite references, which the examiner may have possibly overlooked or failed to find. This is a true adversary procedure and it has every advantage of the inter partes type procedure without its flaws of harassment and heavy costs which I must say I seriously object to, and which I know NAM formally has objected to, also.

Incidentally, since the voluntary protest procedure was announced, it is very interesting that the comments I have informally received from numerous people in the patent profession are that, although it is voluntary, in effect it will be the same as if it were mandatory. If an applicant for patent, upon receiving notice of allowance from the Patent Office, declines to take advantage of the voluntary opportunity, what will he say if his patent should go into litigation in the

Federal courts when the court asks why the applicant failed to take advantage of it when he had the opportunity? The court may well ask whether there was some reason why the applicant didn't want to expose his patent to public review before final grant. In the absence of a satisfactory answer, the court may well be disposed toward ruling against the applicant on one ground or another.

Well, with this premise, I believe you can see that this voluntary thing may work out to be the equivalent of a mandatory proceeding. I just suggest—and many people I have talked to seem to agree—that this is what will happen. If so we will have accomplished the desired objective action, without the need of legislation. What's more, if there are any problems which surface during its implementation, it will be much simpler to make necessary adjustments administratively if there are no rigid legislative requirements that restrict the making of such changes.

Now, Senator, again referring to your introduction of S. 1321, you called attention to the fact that of the patents adjudicated by the courts in recent years, 72 percent were found invalid. When you did so, you struck at the heart of one of the most critical issues involving everyone who is concerned with the patent system today, both its proponents and its critics. Actually, those figures should be re-analyzed in terms of which patents get to be reviewed by the courts, and what decisions were included. I understand the Patent Office has made such a study and has determined that the real figure is more like 50 percent than 72 percent. Anyway, I won't even attempt to discuss it at this point because I have made no study of the matter myself. But putting that aside for the minute, valid patents are all important, and from your espousing a strong patent system in this particular reference, Senator, you clearly are seeking to have legislation that will make for valid patents, as are all of us who are interested in a truly viable patent system. In this area I will depart momentarily, but only indirectly, from the specific questions you asked.

It so happens that I proposed another innovation a while back which might lead to patents that will practically never become invalid in the Federal courts. If the proposal were to be adopted, patents will become incontestable on that issue except for possible fraud—

Senator HART. Except for possible what?

Mr. FORMAN. Fraud in the Patent Office, Senator.

If fraud is an issue that comes out in the courts in the course of a patent infringement suit, of course, it would then have to be adjudicated. But the issue of patent validity on any other ground, such as prior art, will not be able to be raised. In any event, sir, I remind you, if I may, that last fall I sent you and other Members of the Patents Subcommittee a copy of a paper I wrote in which that proposal was discussed. I want to take the opportunity at this time to thank you for your kind letter acknowledging it. You didn't say anything specifically about that proposal but you did remark—and if I may I am going to give this letter to your counsel—that though you could not agree with everything I stated you found the paper interesting, and so forth and so on.

I hereby hand to Mr. Nash, your counsel, a copy of my paper, as it was published in the February 1973 issue of the Journal of the Patents Office Society. Your and your staff should note with interest that my proposal has received public endorsement by the Honorable Bruce B. Wilson, Deputy Attorney General for Anti-Trust, as a possible solution to the problem of invalid patents. I think if you are looking at this whole question the proposal I advocated there ought to be considered in depth before you finalize your recommendations for a new patent statute.

Now, I won't go into the description of it now unless there is some reason for your wanting me to do so, possibly to explain how that proposal will operate, because I believe my published paper will describe it to you and others concerned in adequate detail.

Let me refer now to the proposal for a public counsel in the Patent Office. First of all, the NAM position is definitely opposed to the proposal spelled out in S. 1321, which would create an office of public counsel in the Patent Office under certain specific conditions. NAM is not opposed to studying the need for such a public counsel in the Patent Office or how he should function, but it urges that before making any moves in that direction—since it is so drastic a change, particularly as spelled out in S. 1321—that very serious detailed study of the staffing and the day-to-day operations of that Office should first be carried out and made available to the public with an opportunity given for the public to give its detailed comments. Also, alternative ways to that proposal should be considered as part of the study.

I was pleased to hear Professor Stedman speak along these same lines with regard to that issue earlier today, and I think we see eye to eye on that; we cannot and should not move into something as complicated as what is proposed in S. 1321 without such a study in depth. Personally, I would suggest something, too, apart from what he has said. I question whether by legislation one should spell out so completely to almost the nth degree just what a public counsel should do. I think it more sensible, if a public counsel or ombudsman is going to be in the Patent Office at all, the manner in which he should function should be left to the administrative discretion of the Commissioner of Patents, and let him work it out and try to see now it can be best done to make the office of the public counsel accomplish the goals you and we are seeking.

Getting back to the formal position of NAM on this point, I would like—and also I could endorse this personally myself—I would say most of the functions that are expected to be performed by the public counsel actually are now available. For example, the government, through the Justice Department, now has the power under certain circumstances to go to the courts to sue to cancel a patent. Second, the Justice Department or any other agency of government would be in a position to participate in the proceedings of section 135 of S. 1321 or the proceedings in the re-examination after issue proceeding spelled out in sections 191 and 192 of S. 643 of the last Congress. Third, even now the examiner in the Patent Office has the right to be present and argue his side of the case when it is up before the board of appeals.

As a fourth point, a member of the office of the solicitor in the Patent Office handles the case for the Patent Office in every appeal which is made to the district court, the court of appeals, or the Court of Customs and Patent Appeals. So you see you have at least four different levels or four different situations where in effect the very functions that you wish to have assigned to the public counsel are now available and in force.

One last point on the public counsel provision in S. 1321. I see serious administrative problems, particularly as spelled out for the public counsel, in the bill, but possibly the worst administrative situation I can envision is the fact that you are setting up in effect two Commissioners in one Patent Office and in certain respects they both have the same responsibility. In fact, as I read it, I think the public counsel can overrule the Commissioner in some situations. I don't think that is what was intended, and it certainly is not to be desired, but the provisions of the bill may make such a result possible.

Although I have made all of these statements about the objections to the public counsel proposal, let me remind you that I did state that there may be some merit to it; it depends on how it is implemented. Earlier today I mentioned the existence of an informed APLA Patent Office Advisory Committee. I recently had occasion to make another suggestion to that committee along the following lines. If the voluntary protest proceeding is carried into effect after the Patent Office holds hearings on it next month, why don't we have the Commissioner consider providing for a form of public counsel who will serve only to act as a representative, the advocate if you please, of the people who cite art to the Patent Office in the voluntary cases? To do this will give us the benefit of actual experiences with a public counsel in those situations first, and in that way we may find out if there are any bugs in the procedure as it is implemented. Maybe in that way we can arrive at a procedure that will accomplish the goals you are seeking and which we in industry and we in the patent profession all would like to see.

Getting on with the next point, Senator, the deferred examination of patent applications, basically NAM is opposed to this but, if a detailed study of this subject should provide convincing evidence that the benefit of such an approach would exceed the cost on a national basis, NAM would agree to the desirability of its establishment. Here again I refer back to my good friend Professor Stedman's testimony earlier today. He seemed to advocate the same thought; deferred examination may have its merits, but as far as the U.S. patent operations are concerned, it deserves very detailed study before we just jump into it. The panacea that some people see in deferred examinations may be just a mirage. We don't know for certain, thoroughly and beyond all possible objections, that the systems in Holland, in Germany, and elsewhere are absolutely satisfactory.

My office has worked with deferred examinations and we found some flaws in it. I have talked to Dutch practitioners and German practitioners about it. We have attorney associates in those countries and they say they are not completely satisfied with it, some even saying that it should be done away with. So I am not sure that we should just adopt it simply on the basis of the fact that it looks like

an easy way to possibly cut down the number of cases that the Patent Office has to review to get rid of a backlog. Even this cause is fallacious when you make a comparison of the systems. They had a 5-year or more backlog in Holland when they went to this system. We now are running on an average of about $2\frac{1}{2}$ years in the United States, and I understand it is getting close to 2 years in the examination phase from filing to issuance. Moreover, as you know, the Patent Office has for several years been striving for one of its major objectives, i.e., to get the entire proceeding from filing to issuance down to 18 months. If we get it down to 18 months, I see no reason why we have to go to a system of deferred examination which has problems such as the following:

First of all, it would seem to me—and I think Professor Stedman mentioned it before, so I will have to give him full credit since he pre-empted me on it—I know that people will rush in and are rushing into the Patent Offices having deferred examination procedures with half-baked applications. Why? The answer is simple. Why should one bother testing out every single thing that has to be tested before one gets a really thorough application, when one could just rush in to the Patent Office and get an early filing date, and then wait 5 years or 7 years before actually having to decide whether one has the right application to pursue under a full examination? It is almost an invitation to have applicants rush in and file in the Patent Office a lot of useless applications. It is my guess that this may account for the reason why, Senator, when you introduced the bill, your introductory statement said that in Holland 59 percent of the applicants for patents eventually chose to let their applications lapse. Well, if they are the kind of applications for patent that haven't been fully studied, the kind where the research work hasn't been fully worked out before they file, obviously there would be a lot of useless patents and they should be dropped. If a good pre-examination search is made by the applicant, and the opportunity is available for him to test out the various aspects of his invention before filing, the chances are that fewer applications will be filed. This is the system we now have in the Virgin Islands. If we go to deferred examinations possibly many thousands more applications will be filed needlessly, only to be dropped in due course. If so, we may not get any benefit out of the procedure—just more work and more costs for all concerned.

Whatever objectives or goals to be obtained by the deferred examination, it is deserving of note that the Patent Office does have right now a sort of deferred examination in what it calls its defensive publication program. It was implemented on May 1 of 1968 and in effect this works as if it is a $2\frac{1}{2}$ -year deferred examination system. Under this program an applicant has that period of time after filing his initial application to decide whether he wants the case examined by the Patent Office. That is deferred examination. If you think this is desirable, find ways and means to encourage it. This is voluntary, Senator, to find ways to induce the people to use it. It already is in existence, and you don't even have to pass legislation to accomplish it. I understand that from May 1968 through January 1973 some 861 requests for defensive publications had been received by the Office.

Now let me get on to the question of maintenance fees. For years NAM has been on record that it endorses the proposition that Patent Office fees should support a fair share of the cost of operating the Patent Office, and this continues to be the NAM's position. NAM does not favor maintenance fees, primarily for the reason that they involve burdensome and costly administrative problems which would be a heavy burden on the applicants, on innovators, and on investors, in developing new inventions. Here again, let me remind you that we should think in terms not only of major corporations with big budgets for this purpose, but also the little fellow who possibly cannot afford it. Yet, if maintenance fees are to come, this will certainly be the lesser evil than, let us say, an increase in the filing fees or the issuance fees which may discourage independent inventors from resorting to the patent system to protect their inventions.

On this point let me call attention to a publication, an editorial in the *Journal of the Association for Advancement of Invention and Innovation*, February 1973, called "The Effect of Patent Office Fees on Independent Inventors." This study seemed to indicate that at least in the middle 1960's there was a significant drop in patent applications filed at the time that we had the patent filing and issuing fees increased, and this should be a fact to be heeded and considered carefully before we go to heavy maintenance fees or increased filing and issuance fees because I don't think we want to discourage the filing of applications on potentially useful inventions.

In any event, we should be extremely cautious if we are to go to a maintenance fee system. Certainly the figures used—the proposals in S. 1321—seem highly excessive and possibly confiscatory of patent property if they discourage people to try to pursue their patents, and possibly to let them lapse before they catch on and become actively utilized. Such discouragement may lead to fewer inventions being developed to the point where they can contribute to the progress of our country, and this would certainly be a lamentable result.

Now, to the last point of the five to be considered at these hearings, namely the question of the restructuring of the Patent Office. This particular issue received considerable study by two NAM groups, not just its patents committee but a group of corporate executives, because it seemed like such an important departure that was being proposed. The position arrived at was that the association recognizes the laudable objectives in the proposal to establish the Patent Office as an independent executive agency reporting to the Congress. On its face it would appear to give the Patent Office an elevated status within government and presumably, as was brought out earlier, this would make the official spokesman of such an agency be one of increased prestige in dealing with the Congress and other Federal bodies, and with the representatives of foreign governments concerned with international patent and trademark affairs. However, like a lot of other things which look like ideal solutions at first blush, a second look sometimes develops some flaws and I think we see them in this case. We question whether the possible attainment of these objectives would offset the disadvantages which may well develop in taking the Patent Office out of the Department of Commerce. Instead of doing that we recommend that such a basic admin-

istrative change at least warrants in-depth studies of the possible effects in various areas of national interest. Based on past experiences with the present structure it must be stressed that there clearly are advantages in having a Cabinet officer at the organizational pinnacle in which the Patent Office is located. Thereby matters affecting the patent system may, when necessary, be more readily brought to the direct attention of the President—and his support may be enlisted for programs meriting and requiring such backing if they are to succeed.

In terms of intragovernment relationships it seems that the position and support of the Secretary of Commerce may be of far greater value to carrying out the goals of the Patent Office than would be the relatively lesser prestige and weight of the head of the Patent Office if the latter were to be an independent executive agency.

Even in terms of its dealings with Congress, the Patent Office may find itself far more effective in presenting proposals for new legislation and such things as establishing budgetary needs, and so on, than if it were to operate as one of the many independent regulatory agencies.

Now, sir, I am going to make reference to some authorities in the field as I try to act as a pseudo expert in the field of public administration, and that is the reason, incidentally, why I gave you my particular academic qualifications in that area earlier. I refer to at least one work, a classic in its field, a textbook I used as a student and in a later edition which I used in the course I gave, namely "Elements of Public Administration," edited by Prof. Fritz Morstein Marx, who has served with distinction on the faculties of Pennsylvania, Princeton, New York, Harvard, Columbia, and American Universities, as well as on the staff of the Director of the Bureau of the Budget. In particular, I will refer to one of the chapters in that book authored by Prof. James Fesler of Yale who formerly was in the U.S. Budget Bureau before it became OMB, and who also served on the first (Hoover) commission on the organization of the executive branch of the Government. He has other qualifications which all in the field of public administration well recognize. He wrote a chapter entitled the, "Independent Regulatory Agencies," and I have abstracted from it just a few thoughts. First, on this question of independence. What is it: is it real? We should inquire as to independence from what? Independence from the Chief Executive? That is one possibility. Independence from the legislature? That is the other possibility. To have them both would amount to complete, genuine independence, but he says both of these are myths. In reality there is no such thing. You cannot be completely independent of either, and if you examine the history of the independent regulatory agencies, I think no one could deny it. On its face each independent regulatory agency does possess some degree of independence. Some have more and some have less, but in no case is independence absolute. It may be, as we have heard testified today, that there have been problems in the existing structure of the Patent Office vis-a-vis the Department of Commerce or the Assistant Secretary of Commerce for Science and Technology, and so forth—it is not for me to go into that

discussion—but I think it important to raise one question. Will we of necessity overcome the alleged problems with the existing structure of the Patent Office in the Department of Commerce merely by going to the independent agency? I have my serious doubts. I don't think it is worth the risk doing so, at least not without a complete and thoroughly weighing of all the pros and cons, and without first attempting to resolve the alleged problems within the confines of the existing administrative structure.

Just to mention a few thoughts of Professor Fesler about this idea of complete independence, first of all with reference to the Chief Executive, S. 1321 doesn't point out anything about removal. It talks about appointment but is the Commissioner to be appointed for an indefinite term? There have been some interesting cases involving tests of the President's authority or lack of it to remove the head of an independent agency. Suppose you get the head of an agency—the Commissioner in this case—who just doesn't measure up according to someone's judgement. In that event who takes what action? I merely raise the question; I don't and won't have the answer, not without considerable study at any rate.

As far as this independence from the legislature, well, the agency, naturally will require financial support and basic authority, both of which it will get from the legislature. The legislature can control the purse strings. Maybe the independence is again transparent and not at all real, if by controlling the purse strings the legislature can control the operation of the agency. The same thing would apply to Chief Executive, I guess, if the agency head needs clearance or co-operation from the executive line departments. Possibly he won't need it from the OMB, but if he needs it from the Comptroller General there is bound to be exerted some kind of control. Will such control be better than what is available now in the Commerce Department? All I am saying here is that when we think of independence we better think fully how far we can go, and whether we will really gain the objectives that S. 1321 talks about.

Another point that Professor Fesler suggests and discusses is the price of independence. This is exceedingly important. Are we willing to pay the price? There is definitely a need for policy coordination in the operation of the Patent Office. The public has the right to expect that the left hand should know what the right hand is doing. Will we be able to coordinate what the Patent Office does with the Federal Trade Commission, with the Justice Department and other departments any better than we do now with the Patent Office in the Commerce Department? That is the first question. I think it needs to be answered. It certainly needs to be studied.

Second, is the question of setting performance standards. The bill suggests that there will be an advisory council. Well, we have learned from history that independent agencies—well, the fact is that even line agencies of government have their clientele, so to speak, and pretty soon the clientele come in and effectively set the standards. How independent will the advisory council be? These are questions I can't answer at this time, but I do raise them as some things that have to be answered before we go to such a drastic change as an independent agency status for the Patent Office.

A third and last point that Professor Fesler makes on the issue of the price of independence is the question of vesting authority in an agency that is not subject to an official who answers to the people, in other words, a nonelected official. Today, with the Patent Office in the Commerce Department, whether or not we find flaws with the administrative structure or with the personnel involved, at least the presidentially appointed officers are answerable to the electorate. If the electorate is dissatisfied with the management of any phase of the executive branch it can bring about changes by asserting itself at the polls. The independent regulatory agency is devoid of responsibility to the electorate because it is insulated from the voters. This has been one of the problems pointed out by many authors about our regulatory agencies today. In view of this I must ask whether the proposal to make the Patent Office an independent agency will add a problem rather than solve one?

Well it seems to me, Senator, that there are at this time more important substantive issues affecting the American patent system that require the attention of the Congress than that of entertaining purely administrative proposals which are so drastic as almost to be revolutionary. Perhaps, after the Patent Office has had an opportunity to accommodate its operations to the handling of the proposed immediate substantive changes, the time will become more appropriate to consider whether the office basically responsible for the operations of the American patent system would best be administered essentially as an independent agency or to be continued as a segment of a major Federal department.

In conclusion, sir, on behalf of NAM and for myself I wish to state that we are pleased that the present hearings may be the first sign of forthcoming patent law revision in various substantive areas that have been under study for some time. These matters and international proposals, including for example the patent cooperation treaty, indeed warrant direct legislative attention. The viability of American industry—and I might add the importance of it to all inventors large and small—stands to be basically affected by such positive activity.

Thank you very much.

Senator HART. Thank you Dr. Forman. I should for the record ask you to clarify to the extent you can the way NAM develops its positions. We have raised this with other witnesses speaking for associations and groups. How do you reach a position? How many participants do you have? What is this machinery?

Dr. FORMAN. Senator Hart, we have here today my colleague, Mr. Bennett, who is a vice president of NAM. I think he is better qualified than I to answer that particular question. May I ask him to speak?

Senator HART. Yes. Did you get the question?

Mr. BENNETT. Yes, I did, Senator. My name is Reynold Bennett and I am vice president for industrial innovation of the NAM and this area involves the Patents Committee, the Science and Technology Committee, and two other committees. But with regard to your question more specifically, the NAM and its policies, Senator, its policies are approved by the board of directors of the NAM and

they go to the board of directors through the various policy committees. In other words, we have a Committee on Patents that consists of about 150 members. And when I say 150 members, they are individuals from a cross section of companies in the United States that are represented in this committee; that is, not only are they from the companies, Senator, but also we have some private practitioners on the committee who in a sense represent smaller inventors or patentees.

The policy positions are general in their statements. For instance, we have a general policy on patents. But when issues become more important or important enough, although they seem to be more specific, then the policy committee and the board of directors will act on them. Specifically, the board of directors of the NAM has acted on maintenance fees. This goes back a few years, at a time when there was a great discussion on maintenance fees. The board then took the position that, in effect, it was opposed to maintenance fees with certain reservations, which Dr. Forman spoke about in his testimony this morning. Also, the same way with regard to fees to support the Patent Office. The board of directors of the NAM a number of years ago took a position in that regard and again this was enunciated quite well by Dr. Forman this morning. With regard to the membership of the Patents Committee of the NAM, the 150 members I mentioned and also the members of the board of directors, we would be pleased to submit the names of those individuals and their companies if that can be helpful to you.

Senator HART. It would be and we have made that request of others. Thank you for volunteering that information.

Dr. FORMAN. Senator Hart, on the question of volunteering, I wonder if I might retrospectively request that the documents I gave you—my article concerning a proposal for an incontestable patent and your letter to me concerning it—be introduced in the record?

Senator HART. Yes. As a matter of fact I should have made that suggestion myself. I did leaf through it again as you were testifying and, if there is no objection, we will print it in the appendix of the record.

There is one thing—and this is not to develop any distinctions or certainly suggest that what you told us isn't the NAM position because I know it is—but, Mr. Bennett, specifically on the question of an independent agency, is that position of the NAM the reflection of the application of a general attitude or a specific reference to this particular bill?

Mr. BENNETT. Well, as I stated before, the NAM has a general position on patents that doesn't really filter down to this point as to administration. May I say this, the way we approached the current hearings was this way: We drafted what we thought was a general approach to the five points that were brought up and enunciated. This was a 10-page statement or an exposition or discussion or white paper—whatever you want to call it—and this was sent out to the 150 members of the NAM Patents Committee for comments. We received back, oh, I would say about as many as 55 comments which I think is quite good, as a matter of fact, and it did represent a cross-section of opinions. When I say cross-section, I mean some came from chemical companies, some came from individual practi-

tioners and so on. Then an ad hoc committee met to discuss the five points. Again, this ad hoc committee was a cross section from various segments of industry and it considered the draft white paper. The members had this beforehand. They considered the responses we got from the Patents Committee and they spent a full day in discussing various suggestions.

I might say also to that that Commissioner Gottschalk was there at the outset and indicated some of the matters that he did indicate here today to this committee so they had that to consider too.¹ And you brought the question up as to the administrative aspect. As a matter of fact, former Commissioner Brenner was also there and we had the benefit of some discussion from him on this point. The total effect was that we devised what we believed was a consensus in coming up with our recent statement.

Senator HART. The membership of the ad hoc committee was drawn from the Patent Committee basically?

Mr. BENNETT. Yes, it was.

Senator HART. Thank you very much.

Mr. Brennan?

Mr. BRENNAN. No questions.

Senator HART. Mr. Nash?

Mr. NASH. No questions.

Senator HART. I do want to ask about—and I am trying to find the place——

Dr. FORMAN. Was that in our formal statement, sir?

Senator HART. I do want to ask about—well, do I understand that the Patent Office administratively has instituted a program with a 2½-year limit sort of a deferred examination system?

Dr. FORMAN. Yes, I have the formal announcement of the program as it appeared in the Federal Register. Mr. Nash, may I please give you it?

Mr. NASH. Sure.

Dr. FORMAN. This is a copy sir, of that defensive program enunciated earlier.

Senator HART. I think that would be useful to have that printed at this point in the record.

[The document referred to follows:]

From the Federal Register, April 11, 1968

TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER I—PATENT OFFICE, DEPARTMENT OF COMMERCE: PART 1—RULES OF PRACTICE IN PATENT CASES; PART 3—FORMS FOR PATENT CASES

NEW DEFENSIVE PUBLICATION PROGRAM; ADDITIONAL FORM

Sections 1.11, 1.14, 1.101, 1.103, and 1.108 of Title 37 CFR (Patent Rules 11, 14, 101, 103, and 108) are amended or revised and a new § 1.139 (Patent Rule 139) is added to take effect May 1, 1968, for the purpose of instituting a new defensive publication program. A new § 3.50 is added for the purpose of implementing the new program.

The general substance of the proposed revisions and additions was published in the Federal Register of February 20, 1968 (33 F.R. 3189). A hearing was

¹ Mr. Gottschalk spoke generally on Patent matters to a group which included some from the smaller NAM group referred to which met later to discuss S. 1321, specifically. He did not participate in NAM deliberations on its position regarding S. 1321.

held on March 27, 1968, and all persons, who desired to, were invited to attend and to submit their views, objections, recommendations or suggestions. Both oral and written comments were carefully considered. The sections are being revised substantially as published with a few additional changes.

This program is intended to provide better service to the public by making available the technical disclosure of certain applications in which the owner may prefer to publish an abstract in lieu of obtaining an examination by the Patent Office. The defensive publication would be in the form of an abstract of the technical disclosure, printed in the Official Gazette and made a part of the Patent Office search files.

This program will be open to any applicant having an application awaiting action by the Patent Office and who files a written request no later than eight (8) months after the earliest U.S. effective filing date of the designated application and agrees to the conditions of the program, including waiving his patent rights based on the designated application, opening the complete application to inspection by the general public upon publication of the abstract, expressly abandoning his application, the abandonment to take effect five (5) years after the earliest U.S. effective filing date of the application unless within that period interference proceedings have been initiated, and waiving his rights to a patent on a continuing application, filed after the expiration of thirty (30) months from the earliest U.S. effective filing date of the designated application. Until November 1, 1968, this program will be open to any pending application awaiting first action by the Patent Office at the time of the request without regard to the filing date of that application.

In accordance with existing rules and procedures interferences may be declared with applications and patents. During the period beginning with the suggestion of claims by the Patent Office or the filing of claims by the applicant copied from a patent and ending with the termination of proceedings if an interference is declared or the mailing of a decision refusing to declare the interference, abandonment by reason of the expiration of the 5-year period will be stayed. Since the applicant has waived his patent rights and agreed to a defensive publication, termination of interference proceedings in his favor would render the express abandonment ineffective but would not result in the issuance of an enforceable patent. Instead, a normal Notice of Allowance would be issued except that the applicant would be notified that when the issue fee is remitted a disclaimer of the entire term of the patent to be granted in accordance with the second paragraph of 35 U.S.C. 253 should be included.

No special fees will be required for entrance into this program. The applicant will be permitted to include with his request a replacement or expanded abstract of the technical disclosure of up to two hundred (200) words. Acceptance of a request to enter this program will be contingent upon screening by the Patent Office to exclude such material that may be considered advertising, frivolous, scandalous, against public policy, subject to national security controls, etc. Acceptance of a designated application in this program is not intended to preclude the examination of any continuing application filed under 35 U.S.C. 120 within thirty (30) months after the earliest effective U.S. filing date of the designated application.

Upon receipt and approval of the request the application abstract will be published in the Official Gazette. Publication of the abstract in the Official Gazette would be in a separate section identifying the application as being open for inspection by the general public and indicating that it is subject to the New Defensive Publication Program.

Following publication the application would be filed in the Record Section of the Patent Reference Branch where it will be available for inspection upon written request. Copies of the application will be furnished by the Patent Office upon request and payment of fee. The application abstract and suitable drawing copies would then be made a part of the official search files.

After the defensive publication has appeared in the Official Gazette the abstract and suitable drawing copies will be available as prior art from the date of publication under 35 U.S.C. 102(a) or 102(b) as a printed publication. Also, at this time the application will be available as prior art under 35 U.S.C. 102(a) as evidence of prior knowledge from the actual date of filing the application in the Patent Office.

The changes follow:

1. In § 1.11, delete "Patent" from the title. Identify the one paragraph now in the section as paragraph "(a)" and follow with a new paragraph "(b)", so that the section reads as follows:

§ 1.11 Files open to the public.

(a) After a patent has been issued, the specification, drawings, and all papers relating to the case in the file of the patent are open to inspection by the general public, and copies may be furnished upon paying the fee therefor. The file of any terminated interference involving a patent, or an application on which a patent has subsequently issued, is similarly open to public inspection and procurement of copies. See § 2.27 for trademark files.

(b) Applications in which the Office has accepted a request filed under § 1.139 are open to inspection by the general public, and copies may be furnished upon paying the fee therefor.

2. In § 1.14, insert "Except as provided in § 1.11(b)" at the beginning of the first sentence of both paragraphs (a) and (b), so that these paragraphs read:

§ 1.14 Patent applications preserved in secrecy.

(a) Except as provided in § 1.11(b) pending patent applications are preserved in secrecy. No information will be given by the Office respecting the filing by any particular person of an application for a patent, the pendency of any particular case before it, or the subject matter of any particular application, nor will access be given to or copies furnished of any pending application or papers relating thereto, without written authority of the applicant, or his assignee or attorney or agent, unless it shall be necessary to the proper conduct of business before the Office or as provided by this part.

(b) Except as provided in § 1.11(b) abandoned applications are likewise not open to public inspection, except that if an application referred to in a U.S. patent is abandoned and is available, it may be inspected or copies obtained by any person on written request, without notice to the applicant. Abandoned applications may be destroyed after 20 years from their filing date, except those to which particular attention has been called and which have been marked for preservation. Abandoned applications will not be returned.

3. In § 1.101, add "except for those applications in which the Office has accepted a request filed under § 1.139" at the end of the last sentence of paragraph (a), so that it reads.

§ 1.101 Order of examination.

(a) Applications filed in the Patent Office and accepted as complete applications (§§ 1.53 and 1.55) are assigned for examination to the respective examining divisions having the classes of inventions to which the applications relate. Applications shall be taken up for examination by the examiner to whom they have been assigned in the order in which they have been filed except for those applications in which the Office has accepted a request filed under § 1.139.

4. In § 1.103, add a new paragraph (d) to read as follows:

§ 1.103 Suspension of action.

(d) Action on applications in which the Office has accepted a request filed under § 1.139 will be suspended for the entire pendency of these applications except for purposes relating to proceedings under § 1.201(b).

5. In § 1.108, delete "and forfeited" in the title and the first sentence, and add "except those which have become abandoned as a result of the filing and acceptance of a request under § 1.139" at the end of the first sentence, so that it reads as follows:

§ 1.108 Abandoned applications not cited.

Abandoned applications as such will not be cited as references except those which have become abandoned as a result of the filing and acceptance of a request under § 1.139.

6. A new § 1.139 is added, the full text of which reads as follows:

§ 1.139 Waiver of patent rights.

An applicant may waive his rights to an enforceable patent based on a pending patent application by filing in the Patent Office a written waiver of patent

rights, a consent to the publication of an abstract, an authorization to open the complete application to inspection by the general public, and a declaration of abandonment signed by the applicant and the assignee of record or by the attorney or agent of record.

7. A new § 3.50 is added to read as follows:

§ 3.50 *Waiver of patent rights.*

To the Commissioner of Patents:

The undersigned having on _____ filed an application for patent, Serial No. _____ entitled _____, hereby waives his right to an enforceable patent based on said application or on any continuing application filed after the expiration of thirty (30) months from the earliest U.S. effective filing date of said application and subject to acceptance by the Commissioner, and requests that an abstract of disclosure thereof be published in the Office Gazette, that the complete application be opened to inspection by the general public upon publication of said abstract, and that the application be considered pending for the purpose of interference; and further the undersigned expressly abandons said application, the abandonment to take effect five (5) years after the earliest U.S. effective filing date of the application unless within that period interference proceedings have been initiated.

(Sec. 1, 66 Stat. 792; 35 U.S.C. 6)

EDWARD J. BRENNER,
Commissioner of Patents.

Approved: April 9, 1968.

JOHN F. KINCAID,
Assistant Secretary for Science and Technology.

[F.R. Doc. 68-4386; Filed, Apr. 10, 1968; 8:49 a.m.]

U.S. DEPARTMENT OF COMMERCE,
PATENT OFFICE,
Washington, D.C., October 1, 1973.

THOMAS C. BRENNAN, ESQ.,
Chief Counsel, Subcommittee on Patents, Trademarks and Copyrights, U.S. Senate, Washington, D.C.

DEAR MR. BRENNAN: This is in response to your letter of September 18, 1973, concerning Dr. Howard Forman's testimony before your Subcommittee on our Defensive Publication Program. Before responding specifically, I would first like to describe the program.

The program permits a patent applicant to request publication of a summary of his application as a defensive publication abstract, pursuant to Rule 139 of the Patent Office Rules of Practice. There is a time limit on these requests, however. They may be filed only if the pending application is awaiting a first Office action; or within eight months of the earliest effective United States filing date of the application, if a first Office action has already been made and responded to. Also, the applicant must provisionally abandon the application. He does retain, however the right to participate in a priority of inventorship contest for five years from the earliest effective United States filing date of the application. At the time of publishing the abstract, the application is opened for public inspection.

A request for defensive publication cannot be withdrawn after acceptance by the Patent Office. However, a patent may be obtained on the subject matter of a defensive publication application if certain procedural requirements are satisfied. If the applicant files a divisional, continuation or continuation-in-part application for this subject matter within 30 months of the earliest effective United States filing date of the published application and the other conditions for patentability are satisfied, a patent may be granted on this later-filed application. Even if the later-filed application is filed beyond the 30-month period, it may still mature into a patent. However, it cannot be accorded the filing date of the defensive publication application.

Applications for which defensive publication is requested are promptly processed for publication. While they are not examined for patentability, they are reviewed by the examiner for compliance with certain formal requirements before being approved for publication.

The defensive publication procedure will usually make the published application publicly available before any later-filed application for the same subject matter would be patented. Members of the public, therefore, are provided with an opportunity to bring to the attention of the Patent Office prior art patents and publications bearing on the patentability of the subject matter. This opportunity is provided for by Rule 291 of the Rules of practice.

At first glance, our defensive publication program does appear in certain cases tantamount to a 30-month deferred examination system. However, most applicants participate in the program for defensive purposes, and do not seek patents. Thus, the program is not regarded by applicants as a deferred examination procedure.

The program is not the first of its kind to solicit the early public disclosure of the contents of patent applications, in lieu of examination. Abstracts of 1,311 applications were published, in accordance with the Notice of January 25, 1949 in the Official Gazette of the Patent Office (619 O.G. 258), between 1949 and 1953. This practice was terminated on August 3, 1953 by an undated notice appearing in the Official Gazette of June 8, 1953 (671 O.G. 316).

A brief program for publishing "abbreviations" of patent applications was conducted by the Patent Office in 1964 and 1965. However, only 14 "abbreviations," as these brief summaries of patent applications were called, were published. This program was announced by the Notice of July 14, 1964 (804 O.G. 183) and terminated by the Notice of August 25, 1965, (818 O.G. 791).

The Patent Office instituted the present Defensive Publication Program on April 11, 1968. Through January of this year, only 857 requests for defensive publication have been received by the Patent Office. We have no information, however, concerning the extent to which applicants entering the program have subsequently sought to obtain patents for the same subject matter. When an application is received in the Patent Office claiming the benefit of the filing date of an earlier filed application, notice of the later filing is not recorded in the earlier-filed application. Accordingly, any determination of the extent to which applicants file subsequent patent applications for the subject matter of an earlier filed defensive publication application would require examination of the more than 500,000 patent applications received since the program was instituted.

I would point out the Administration's patent bill will strengthen the Defensive Publication Program. Under the bill, an application published under the Defensive Publication Program would be available as "prior art" against other applications as of its filing date, rather than its publication date. This change will strengthen the program and make it more attractive to potential users. Thus, the Administration's bill moves in the direction suggested by Dr. Forman.

I would be pleased to answer any questions you may have on this matter.

Sincerely,

RENE D. TEGTMEYER,
Acting Commissioner of Patents.

Senator HART. Do I understand from your testimony that all of the applicants that filed under that procedure let their applications lapse rather than go to examination?

Dr. FORMAN. I don't have the answer to that question, Senator Hart. I did not ask the office for information as to how that program was working.

Senator HART. In your testimony you didn't tell us that all applications lapsed, but you said essentially all applications moved under that program have not been subsequently followed up.

Dr. FORMAN. No, I am sorry if I gave you that impression. If I made a statement along those lines, it was inaccurate. I do not know the answer to that question, Senator. The only information I thought to ask for and which I have in my hand was a note to the effect that through January of 1973, 861 requests for defensive pub-

lications had been received. That is a direct reply to the only question I asked the office to give me.

Senator HART. Well, we can clarify that for the record if Mr. Brennan would in writing inquire of the Patent Office what their experience has been.

Mr. BRENNAN. Yes, sir.

Senator HART. And when it is supplied it will be made a part of the record.

Mr. BRENNAN. All right, sir.

Senator HART. Thank you very much.

[The statement of Dr. Howard I. Forman in full follows:]

STATEMENT OF DR. HOWARD I. FORMAN REPRESENTING THE NATIONAL
ASSOCIATION OF MANUFACTURERS

The National Association of Manufacturers appreciates the opportunity to express these views on the proposed critical patent law revision matters being considered in this current hearing. It makes these comments as a voluntary association of business concerns of varying sizes and commercial activities, and located in every state. Participants in the NAM membership are companies and individuals fostering and investing in the scientific and technological endeavors that have enabled this Nation to earn the reputation as a leader in providing the climate for creativity which has enabled the development of some of the most important products and processes utilized today.

But the present gives rise to the future and perhaps more than ever before in the history of our nation, we must stimulate and encourage invention and innovation to meet national and international needs. We need better productivity from inventions to improve the standard of living for everyone, and to hold down inflation. We look to practical discoveries and inventions for competing internationally in order to improve our balance of trade and avoid further devaluation of the dollar in the world marketplace. Moreover, we need better products and processes to overcome our national problems relating to health, transportation, housing, energy, and the environment.

Essential to the achievement of these needs is unquestionably a strengthened patent system that will provide the incentives necessary to encourage investment of time and imagination, energy and money to bring to the marketplace an increasing catalogue of exciting inventions. Most important to note—such incentives are needed alike by independent inventors, and company research teams of all sizes as well as other invention-oriented organizations such as universities.

It bears pointing out that a Constitutional provision relating to the patent system provides: "The Congress shall have power . . . to promote the progress of . . . useful arts, by securing for limited times to . . . inventors the exclusive right to their respective . . . discoveries." Thus, our comments on proposed changes in existing patent statutes being presently considered are assuredly made in the light of what we believe would be their very special effect on promoting the progress of the useful arts in the United States.

MODIFICATION OF PATENT EXAMINATION PROCEEDINGS TO PROVIDE PUBLIC
ADVERSARY HEARINGS

We view with optimism the prospect of improvement to the administrative procedures in the Patent Office which will enhance the validity of issued patents. Specifically, we support public involvement in calling attention to the Patent Office of "prior art". However, we are not in favor of attempting to attain this objective by the adversary procedures set forth in the current S.1321 (Sec. 135). Rather, we believe that the objectives so sought would be better served by the procedures set forth in Sections 191 and 192 of S.643 (Committee Print) considered by the 92nd Congress. In this connection, it should be noted that those procedures set forth in S.643 originated from the 1966 Report of the President's Commission on the Patent System. This report contained a number of proposed changes in the U.S. Patent System that were

devised after more than a year of deliberations. Further, the final provisions of S.643 were arrived at only after extensive hearings by patent committees of the 90th, 91st and 92nd Congresses and as a result had received broad-based support from the patent profession.

To summarize the essential differences between the two legislative proposals: Under S.643, as considered, procedures are established whereby 3rd parties would call Patent Office attention to prior art that would affect the validity of issued or issuing patents. If the Patent Office decides that the cited prior art has merit, then the prosecution of these cases would be reopened to consider such prior art. Under S.1321, public adversary hearings would allow for proceedings that might well be harassing to the applicant (since the 3rd party would as a matter of right have the opportunity to engage the patentee in a long and costly proceeding). There is no basis to predict that this easily abused form of procedure would enable the Patent Office to reach more satisfactory conclusions than the approach of S.643.

The President's Commission on the Patent System fully considered other forms of adversary proceedings and rejected them in favor of the approach set forth in S.643. Perhaps the most serious objection to an inter-party adversary proceedings, such as is provided in Section 135 of S.1321, is the high cost which would be imposed on an applicant or patentee as a defendant in the process. Certainly the cost of obtaining a patent is already high enough without placing this additional burden on inventors. Thus, essentially the same beneficial results could be obtained by the procedures set forth in Section 191 and 192 of S. 643 at substantially lower cost.

Experience with inter-party adversary procedures in Germany, Holland and England are reported to demonstrate clearly the high cost in money and time that are involved in such proceedings. Such an approach is especially burdensome and prohibitive from the standpoint of independent inventors and small companies. Even in the case of larger organizations, the cost becomes prohibitive under this particular system because many companies (based on European experience) apparently tend to oppose automatically their competitors' patents in process of issuance whether or not there is any genuine basis for doing so.

Further, with regard to Section 135 of S.1321, it is suggested that it would be administratively more efficient, in any event, to issue the patent first and then have such patent subject to examination or reexamination. In this way, millions of dollars in additional printing costs, not to mention the additional cost of maintenance and searching of the files of such documents, could be saved by the public and/or patentees and with essentially the same results from a substantive standpoint.

Also, it is recommended that the Commissioner of Patents be given the flexibility of determining who in the Patent Office would have the responsibility of handling the examination or re-examination under this proposed Section. Thus, the Commissioner should not be restricted to having Primary Examiners handle this responsibility since it might be better to have someone else involved in the proceedings who would not have participated in the original decision to grant the patent. Again, it would be best to leave this decision as an administrative matter for the Commissioner.

It is suggested, moreover, that other ways to utilize the expertise of the Patent Office in adversary proceedings relating to patents should be explored. Thus, perhaps in patent situations that would normally be litigated in court, it might be worthwhile to consider referring the matter of the validity of the particular patents involved, at the option of one or both parties, to the Patent Office for a decision or opinion on validity based on the evidence before the Court.

Finally, it should be noted that next month the Patent Office will be holding administrative hearings on what has been called "Voluntary Protest" proceeding, a form of adversary procedure similar to that encompassed by Section 191 in S.643 of the last Congress. Assuming that this voluntary adversary proceeding is adopted, we can expect that the next year or two will witness the development of a considerable amount of actual experiences that will be invaluable in determining just what kind of adversary proceeding should be made mandatory through legislation. Accordingly, it is suggested that prudence dictates deferment of legislative action in this area until this kind of experience, which appears to be imminently available, is considered and appropriately evaluated.

CREATION OF THE OFFICE OF PUBLIC COUNSEL

We are opposed to the present proposal to create an Office of Public Counsel in the Patent Office. Further, while we are not in favor of studying new proposals endlessly, we considered for enactment into law, a detailed study of the staffing and day-to-day operations of the Office should first be carried out and made available to the public for detailed comment. In addition, such a study should consider alternative ways to accomplish the intended purpose of this proposal to determine whether the amount of money involved might be better spent in another way to achieve this same purpose.

As a basic observation, it would appear that the functions of the proposed Public Counsel are mostly all now available to the Government. For example, the Government through the Justice Department now has the power under certain circumstances to go into Court to sue to cancel a patent. Furthermore, any agency of the Government would be in a position to participate in the proceedings of Section 135 of S.1321 or Sections 191 and 192 of S.643 (92nd Congress) without need of any Public Counsel as proposed. Also, at the present time the Primary Examiner at his option has the right to be present and argue his side of the case before the Board of Appeals. In addition, a member of the Office of the Solicitor handles the case for the Patent Office in all appeals from the Patent Office to the District Courts, Courts of Appeals and Court of Customs and Patent Appeals.

Moreover, from an administrative standpoint, the proposal would appear to create various problems. For example, the Commissioner of Patents is presently responsible for assuring that high quality patents issue. In accordance with the new proposal, there would then be two people, the Commissioner and the created Assistant Commissioner for Appeal, Litigation and Public Counsel—both having this same responsibility. In addition, at the working level the Primary Examiner is responsible for assuring that high quality patents issue. Again, in the case of this new proposal, there would then be two people, the Primary Examiner and a representative of the Office of Public Counsel sharing this same responsibility at the working level. Furthermore, it would appear that the representative of the Office of Public Counsel would necessarily be much less experienced in a given field of technology than the Primary Examiner.

One of the major keys for improving quality of issued patents is to provide a system under which the Examiner receives more information pertinent to validity than is now currently available to him. In this connection, it is not persuasive that the proposal for a Public Counsel will have any significant positive effect on the examination of the more than 100,000 applications filed and the more than 70,000 patents issued each year. Thus, it would appear that the money involved might be better spent in improving the search systems used by the Examiners and expanding the Patent Office's present program for quality study, audit and control, or in the public citation of prior art and the re-examination of patent procedures of S.643 of the 92nd Congress as previously set forth herein.

ESTABLISHMENT OF A SYSTEM FOR DEFERRED EXAMINATION OF PATENT APPLICATIONS

On balance, we would recommend the establishment of a system for deferred examination of patent applications unless, perhaps a detailed study of this subject should provide convincing evidence that the benefits of such an approach would exceed the costs on a national basis. It is understood that a detailed study of the subject conducted by the Patent Office in the Middle 1960's showed that the costs of such a system were about the same as the benefits so far as the Patent Office budget was concerned. Thus, the savings realized by not examining applications were offset by the increased cost of printing, filing, classifying and searching the increased number of published patent documents. Any new study of the subject should also include an analysis of the effect on the creative forces in the private sector.

Deferred examination systems have been adopted by a number of countries such as Germany, Holland, Japan and Australia. However, the major reason for adopting deferred examination in these countries was the problem manifested by the enormous backlog of unexamined patent applications and the resultant delay of five or more years in the issuance of patents. It is particu-

larly significant to note that the proposed European Patent System will not involve a deferred examination system, presumably because the Europeans apparently now believe that it is more efficient for all concerned to have applications examined officially and promptly in the European Patent Office.

In the case of the United States, the Patent Office has reduced the average pendency of patent applications for a period of more than three years in 1963 to about two years today. Furthermore, the Patent Office is reported to be well on its way to its goal of an average pendency of 18 months which corresponds to the period for publication in countries having deferred examination systems.

It is interesting to note that the Patent Office's present Defensive Publication Program is, in effect, a 2½ year deferred examination system. Under this program an applicant has that period of time after filing his initial application to decide whether he wants his case examined by the Patent Office. Indeed, it would be worthwhile to study ways in which the Defensive Publication Program might be strengthened to encourage more applicants to use it. It is understood that essentially all applications that have been processed under this Program have not been subsequently examined as a result of a request by the applicant. If this is the case, then it would appear to be a highly efficient system, since the ideal deferred examination system is one which examines all patent applications of some commercial interest to someone (i.e., the applicant and/or third parties) and does not examine patent applications of no commercial interest to anyone, namely, a system having 100% selectivity.

REVISION OF THE PATENT FEE SCHEDULE, INCLUDING THE ESTABLISHMENT OF MAINTENANCE FEES

We have been on record for many years as supporting the proposition that Patent Office fees should support a fair share of the costs of operating the Patent Office. This continues to be our present position.

We do not favor maintenance fees, particularly on account of the administrative problems which would be involved and the double tax burden this places on innovators and investors. However, we believe maintenance fees to be a lesser evil than further increases in filing and issue fees which are about as high as they should be, particularly in the case of individuals and small companies of limited resources. It is understood that a recent study of the filings by independent inventors showed that there was a significant drop in their patent applications at the time of the patent fee increase in the middle 1960's.

Whatever cost burden must be borne by the users of the patent system, they should not, in effect, destroy patent values, become confiscatory, or be considered simply as a property tax. As an important consideration, there are numerous examples of patents only becoming of commercial value in their later years.

If it should be decided that a system of deferred fees is to be adopted by the United States, it is recommended that it not be a system involving yearly payments in order to minimize the administrative burden to the Patent Office and patentees. Thus, for example, it is recommended that consideration be given to having such payments made every fifth year.

ADMINISTRATIVE RESTRUCTURING OF THE PATENT OFFICE, INCLUDING THE PROPOSED ESTABLISHMENT OF THE PATENT OFFICE AS AN INDEPENDENT AGENCY

We recognize laudable objectives in the proposal to establish the Patent Office as an independent executive agency reporting to Congress. This would appear to give the Patent Office an elevated status within government, moreover, the official spokesman of such a singular agency presumably may experience increased prestige in dealing with the Congress, other federal bodies, and with representatives of foreign governments concerned with international patent and trademark affairs.

While such objectives may be meritorious, we question whether their possible attainment would offset the disadvantages which may well develop in taking the Patent Office out of the Department of Commerce. We would recommend that such a basic administrative change warrants in-depth studies of the possible effects in various areas of national interest, and based thoroughly on past experiences with the present structure.

We must stress that there clearly are advantages in having a cabinet officer at the organizational pinnacle in which the Patent Office is located. Thereby, matters affecting the patent system may, when necessary, be more readily brought to the direct attention of the President. In terms of intra-governmental relationships, it seems that the position and support of the Secretary of Commerce may be of far greater value to carrying out the goals of the Patent Office than would be the solitary prestige of the head of the Patent Office if the latter were to be an independent executive agency. Even in terms of its dealings with Congress, the Patent Office may find itself far more effective in presenting proposals for new legislation, establishing budgetary needs, etc. than if it were to operate as one of the many independent regulatory agencies.

We believe that there are at this time more substantive issues affecting the American patent system than that of entertaining proposals involving a very drastic change in the government's organizational placement of the Office. After the Patent Office has had the opportunity to accommodate its operations to the handling of proposed immediate substantive changes, the time may be more appropriate to consider whether the office basically responsible for the operation of the American patent system would best be administered essentially as an independent agency or as a segment of a major federal department.

We are pleased that the present hearings may be a harbinger of forthcoming patent law revision in various substantive areas that have been under study for some time. These matters and international proposals including the Patent Cooperation Treaty indeed warrant direct legislative attention. The viability of American industry stands to be basically affected by such positive activity.

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Mr. BRENNAN. Mr. Chairman, the final witness in this series of hearings is Mr. Milton Weissman.

Senator HART. Mr. Weissman. You are a patient man.

Mr. BRENNAN. Mr. Weissman, you have a rather lengthy prepared statement and I think it will accommodate the hearing if we place it in the record.

Senator HART. That is because he is an author and an editor.

Mr. BRENNAN. It would accommodate the subcommittee considerably if you would have it printed in full in the record and then focus all of your testimony on the five issues that are included in the hearing.

Senator HART. It will be printed in full.

Mr. WEISSMAN. Senator Hart, I will try to concentrate on the matters that really haven't been discussed too much.

STATEMENT OF MILTON WEISSMAN, PRIMARY EXAMINER, U.S. PATENT OFFICE

Mr. WEISSMAN. By way of introduction, my name is Milton Weissman. I am a primary examiner in the U.S. Patent Office. I have close to 29 years of experience in patent examination and over 2 years of experience in patent classification and retrieval systems. I am also the editor-in-chief of the journal of the Patent Office Society, to which I was appointed in April of 1967. Before that I was appointed as the assistant editor in February of 1963, so I have over 10 years of experience, of editorial experience, in patent-related matters.

Now I think I want to make clear that the opinions expressed in the prepared statement are fully my own, and they don't represent and I don't want them to be judged as representing or having been adopted by any organization of which I am a member.

Senator HART. Fine.

Mr. WEISSMAN. Now, the first section of the prepared statement is entitled, "Patent Invalidity: A Crisis for the United States Patent System."

Almost all recent discussion, either written or oral, dealing with the subject of the invalidity of patents is based on the premise, either stated expressly or implied, that the courts are applying a standard of patentability which is far too strict. Now it is high time indeed that the opposite side of the coin be closely scrutinized. The conduct of those responsible for the issuance of patents should be questioned, and this is true regardless of whether or not one agrees that the courts are applying a too strict standard of patentability.

Now, do the officials of the Patent Office really care about the validity of the patents which are issued from their agency, as long as the production goals which they set for the patent examiners concerning the disposal of patent applications are met? The official position of the Patent Office is that they do desire the issuance of patents of the highest possible validity. But, in view of their actual conduct concerning production goals, this position must be viewed as at least open to question. As long as the officials of the Patent Office demand greater production of disposals each year, even though the

number of examiners remains about the same and the amount of prior art to be searched increases ominously each year, it is difficult indeed for anyone with an objective viewpoint to be convinced that they are paying anything more than lip service to the concept of the highest possible patent validity.

Nor are the others involved in the issuance of invalid patents to be considered entirely blameless. Do patent attorneys and their clients, the inventors, really care anything about the validity of the patents issued to them, as long as they can obtain these patents (which may or may not be valid)? Here again all concerned take the position that they only want patents of the highest possible validity to be issued. But again, in view of their actual conduct in the prosecution of patent applications, their strict adherence to this viewpoint is open to question. Is it too much to ask, for example, that they at least disclose to the Patent Office the best prior art of which they are aware? Then the examination process could be focused on the issue of whether or not patentable subject matter has been disclosed, in view of the examiner's and the applicant's best prior art, which is the best possible way to buttress the presumption of validity accorded to patents by statute.

Furthermore, the attitude of the patent bar toward any proposal for altering the present patent system, even though expressly designed to aid in the goal of having patents of greater validity issued by the Patent Office, can at best be described as merely lukewarm. Is it really too much to ask that they put aside self-interest at least to some extent, to pursue a goal of having patents of the highest possible validity issued by the Patent Office?

Now, the Patent Office has always had a tremendous problem, i.e., insufficient time in which to perform a proper examination of a patent application, without any solution therefor. I want to call attention to the following statement by Mr. Donald Brown, then vice president and patent counsel of Polaroid Corp., which appeared at pp. 266-267 of "Hearings before the Subcommittee on Patents, Trademarks, and Copyrights of the Committee on the Judiciary, United States Senate, 84th Congress, 1st Sess.," back in 1955. This is his statement.

We believe that the present shortage of Patent Office personnel makes it impossible for the examiners adequately to search the art if the work of the Office is to be kept on a reasonably current footing. For example, it is our common practice, even in fields in which we are reasonably expert, to search the art before introducing a new product commercially. These searches, which are usually limited to U.S. patents of the last 15 or 20 years, may average 4 to 5 days of one mans time. An exhaustive literature search, such as we make if we are charged with infringement of anothers patent, may run from 10 to 20 days of one man's time or even longer. As opposed to this, it is our understanding that the Patent Office's examiners on the average, can devote not more than one-half day to the preparation of each Office action. *** We do not believe that it is possible, even for a skilled examiner familiar with the art, to make an adequate search and to consider a new specification or a fairly complete amendment within a period of 3 or 4 hours. *** We feel that today much of the technical literature is not searched by the Patent Office examiners. We know that our own searches invariably develop references which we believe are closer than those developed by the Office.

Since at that time a patent application normally received three office actions, the last one being final, it received about 12 hours of

examination by the Patent Office. From those figures it should be quite evident what basically is the cause of patent invalidity. It is extremely interesting to note that at the present time patent applications receive the same inadequate type of examination.

Now, patent applications are presently filed at the rate of about 90,000 or 100,000 per year. To keep the backlog at the same level at least this number of patent applications must be disposed of annually by the Patent Office, i.e., by allowance or abandonment. Because of various factors such as leave, et cetera, assuming that an examiner works 1650 hours per annum, a typical GS-13 examiner without signatory authority is expected to obtain 110 disposals per annum. This averages out to 15 hours per disposal. And might I say this is a figure given in the introduction to the bill. I think that is the source of it.

Now the situation is far worse with respect to a typical GS-15 examiner, having full signatory authority, who is expected to obtain as high as 147 disposals with an average of 11.5 hours per disposal. Any comment that this hardly represents adequate examination of a patent application is woefully inadequate. The next section is entitled "The United States Patent Office: Its Role in Fostering Patent Invalidity."

Now, much as been written recently concerning the causes of patent invalidity, but practically nothing relates to the role of the Patent Office in fostering patent invalidity. Only a few scattered comments can be found in the legal literature, such as the following:

"[The Patent Office] has got to be the sickest institution that our Government has ever invented. It is just as far as I can see an attritional war between the patent applicant and the patent examiner who apparently got paid on the piecework for how many patents they could put out." Judge Miles W. Lord, September 8, 1971, *United States v. Charles Pfizer & Co., Inc., et al.* (Tetracycline civil damage suit), 4-71, Civ 435 (D. Minn.).

What exactly is going on in the Patent Office that would cause a judge in a Federal district court to place such a vitriolic comment in the record of a legal controversy?

It should hardly surprise anyone that the Patent Office, operating under present practices and procedures, is at least one of the prime causes for patent invalidity. There is also hardly any question that some of the practices are a result of the demands made upon the Patent Office with respect to decreasing, or at least maintaining at the same level, the backlog of unexamined applications. But the question here is simply whether or not there can be any justification for the practices and procedures employed by the Patent Office in order to meet the demands made, regardless of what they may be, when it is glaringly apparent that they must inevitably result in a flood of invalid patents. Now exactly what are the practices and procedures, and why must they foster patent invalidity?

This section I have entitled, "A. The Quota System." This is what I am really going to concentrate on, Senator.

Now, what is involved in any quota system is always a subordination of quality to quantity in order to meet some production goal.

This is true even on an automobile assembly line. But the quota system in the Patent Office goes far beyond this. It is not merely a question of subordinating quality to quantity in order to meet a production goal. What is involved is a total obliteration of the concept that there can even be a requirement of quality, regardless of how low it may be, in the examination of patent applications. It is hardly any wonder that examiners refuse to become concerned with the quality of the examination they perform, when the result thereof will be punishment, not reward. How can such a system do anything but foster invalid patents?

Now, the first subsection is entitled, "The Numbers Game."

The quota system has produced many strange results. Examiner productivity is measured in terms of the number of cases he allows, the number of cases which become abandoned (these two together are considered disposals) and, strangely enough, the number of new cases he acts on. Abandonments can hardly be controlled. The prime factor in productivity is therefore allowances, because they are the easiest. The temptation for an examiner to allow a case, when he must meet a production goal, is almost unbearable. The validity of any patent issued under such circumstances is highly suspect. But there is even a greater evil involved. If an examiner allows a new case on the first action, he then gets double credit, i.e., one credit for acting on a new case and one credit for allowing the identical case. In other words, he need work only half as hard as any other examiner and attain the same production rating. If an examiner is not meeting his quota because he is low on allowances and low on abandonments, he can then resort to the expedient of making up the deficiency, at least temporarily, by acting on a sufficient number of new cases. Normally speaking, an action on a new case is the most time consuming one, involving an understanding of the specification and claims, searching the prior art, writing an Office action, et cetera. If an examiner resorts to this expedient in order to meet his production quota, the time he spends on each new case is severely curtailed and the quality of the examination thereof must inevitably be lowered.

And this next section I have entitled, "Superficial Treatment of the Most Complex Cases."

Another equally strange result of the quota system is that the most complex cases receive the least thorough prosecution, a practice which must inevitably result in the issuance of invalid patents. How could such an obviously destructive practice arise, and, even further, how can it be permitted to continue unabated? The answer to these questions is simple: it is the result of a quota system administered in a manner which borders on absurdity.

The key here is complexity; i.e., obviously some cases require more time for examination than others. But the simplest way to administer a quota system is to make the absurd assumption that all cases are of the same level of complexity. Thus, in any examining group, all cases are assumed to be of the same order of complexity, even if more than 50 examiners are involved. Cases involving nothing more, for example, than making a mixture of metals useful as an alloy, and this I have attached as exhibit A, which is two pages, are

deemed to be as complex as cases involving the production of synthetic diamonds, and this I put in the record as exhibit B. An example of other equally complex cases is the production of exotic boron containing compounds, which is exhibit C, which is 35 pages of text and claims compared to 1 or 2 for alloy patents. I might add parenthetically they are of the same order of complexity.

Now, if the officials of the Patent Office were to be questioned on this issue, they would undoubtedly answer that different arts have received different complexity factors. However, these factors appear to be purely mythical because no examiner has ever been told exactly what is the complexity factor for his particular docket. Even if such complexity factors did exist, they certainly did not arise as the result of any legitimate statistical study. It is not too well known, but they arose as the result of politics. The officials having the most influence got the best deal they could, i.e., and assignment of a complexity level as high as possible, for the examiners under them so that they (the officials) personally could benefit by having a lower case load assigned to them. In the not too far distant past all examiners (Officewide) were adjudged to have cases of exactly the same complexity, and their efficiency was measured by the number of Office actions they produced per week. There is nothing to lead me to believe that the present system really differs in essence from the former system.

The next section is titled, "Misuse of Computer Resources."

Perhaps the strangest result of the quota system is the use of extremely expensive computer time to keep production records on examiners which are complete to the nth degree. Production records show, for well over 1,000 examiners, such diverse factors as the number of new cases acted on, the number of allowances, the number of abandonments, et cetera. They also include such other strange items as balanced disposals, hours per balanced disposal, and so on, ad infinitum. What possible justification can there be for employing valuable computer time to compile this mountain of production records, essentially nothing but a mass of trivia, and not of the slightest consequence when pursuing a goal of processing patent applications to produce patents of the highest possible validity.

In view of the urgent necessity of finding some way to employ computers to aid an examiner in the examination of patent applications, the spectacle of employing a computer for nothing more useful than the compilation of infinitely detailed production records is almost ludicrous. Admittedly, no one has yet demonstrated how to successfully employ a computer to completely search all patent applications. But progress has been made in employing computers for search purposes, particularly in the area of the chemical arts and particularly by the British Patent Office. If the U.S. Patent Office is not aware of this, then there is no excuse therefor. Further, all domestic patents in a recently revised chemical class (class 423) are completely coded at least as to process conditions employed. All that remains to be done is to place this information into an information retrieval system, e.g., a computer. Three years at least have gone by since this coding project was completed, and nothing has been done with it. And during all of this period computer time

available to the U.S. Patent Office has been employed for nothing more useful than the creation of examiner production records. There certainly appears to a complete misunderstanding here of exactly what projects should receive priority with respect to the use of computer time.

Now the last paragraph I have on the quota system is entitled, "The Bounty System."

Any quota system must inevitably lower the quality of the product which is produced under it. Just taken by itself the devastating effects it produces are cause enough for alarm. But the U.S. Patent Office has succeeded in adding even one more refinement which serves to lower the quality of the product produced under its quota system still further. This is the bounty system, i.e., an extra reward for exceeding an assigned quota which by itself leads to a lower quality product.

The system employed here is very simple. If an examiner succeeds in exceeding his assigned quota by 10 percent, he then receives a bounty of \$350. The total number of hours he spends per annum in examination of applications is still the same, so that the end result must be less time spent on examining each case. The resultant quality of the product is thus lowered even more. This is not a trivial issue. According to one published report this bounty system was the cause of much wrangling between the former Commissioner of Patents, Gottschalk, who wanted to abolish this system, and the former Assistant Commissioner Wahl, who favored it. Chemical Week, August 1, 1973, page 13. [Exhibit D.]

Now I spent quite a bit of time on that. I will try to summarize a little bit more.

Senator HART. The five specific topics—

Mr. WEISSMAN. Well, do you want me to just briefly summarize? There are other issues here on what else the Office is doing, which I consider pretty bad in harming the system and causing them to issue invalid patents.

Senator HART. All right. Proceed. I have been following your testimony and the positions you have taken on the five specific items as mentioned in your testimony, and while I have interrupted you, let me see if I can summarize at least that part.

Turning to page 24, is it correct that as an individual you believe that the opposition proceeding as suggested in the bill is desirable?

Mr. WEISSMAN. Yes.

Senator HART. That the deferred examination, provided there is a prompt issuance of a report of patentability, you suggest is desirable?

Mr. WEISSMAN. Correct.

Senator HART. And on the maintenance fee, you believe the proposal is desirable?

Mr. WEISSMAN. Yes.

Senator HART. And on the independent agency, you believe it is desirable?

Mr. WEISSMAN. Yes, I spelled that out in quite some detail.

Senator HART. The one I haven't finished reading, so I will ask you briefly to tell us before you turn back to the rest of the statement, is the public counsel section.

Mr. WEISSMAN. Well, I went into points of detail there and the reason I like it is because the Office gets the blame for a lot of invalid patents, that is, as they are invalidated in the courts, on grounds which the Patent Office presently can't review. In other words, supposing somebody has publicly used an invention, that would be grounds for invalidating a claim and it can be invalidated in a court, but the Office has no way to.

I go into other things. I go into a detail we have, Senator, a rule for public use proceedings, but it is never used, or is rarely used.

And what I tried to explain, there are certain aspects of Office practice, such as this public use, where, if we had a public counsel with the proper powers, this issue could be disposed of right in the Office. And that is not the only one, there are others.

In other words, what I would like to see is the Office go into all issues that could invalidate a patent and not leave it to some court, and thereby give us a black eye on something which we don't have any power to investigate right now.

Senator HART. Well, I wanted to make sure we got your position as an individual on those items. Now you can proceed as you desire.

Mr. WEISSMAN. Yes; well, briefly, what I did, I went into quite great detail in trying to show the way the Office operates. Although I am not going to say it is all at fault, but because of the way they operate, they just turn out a product that isn't too good, and this next section I entitle, "Lack of a Meaningful File Wrapper Record." Now, do you want me to just summarize it?

Senator HART. If you would, please.

Mr. WEISSMAN. Well, when you get into court, the validity of the patent is based almost solely on its file wrapper and the purpose of this section is to point out that the way the Office is presently operating tends to lower the value of this file wrapper history. In other words, we have what we call a PO-1142, a first action form, which is so brief that it doesn't really explain anything. There is no chance to develop the issues properly. If a patent gets into court and a judge sees this first PO-1142 form, he is not going to be impressed by it very much because it doesn't say very much. And unfortunately, if a case goes out like that, there has just never been any development of the prior art or of the issues involved.

The second section is entitled, "The Insistence of the Patent Office on Shortening Prosecution Time." This is very interesting because there has been quite a bit of testimony to the panel on the shortening of prosecution time. The present goal is to get the patent issued in 18 months.

Now, what is done there, there are certain ways of shortening the prosecution time in the Office. You try to move up the time as fast as possible to where you act on a new case as quickly as possible, that is, as soon after it is filed as you can. Second, the Office likes to see a second action in a case within 2 months time of the time that the first amendment comes back, and they also would like to see that second action made final. Now, this is very nice. It shortens the prosecution time. But what I try to do here is point out that when you do that, when you do shorten the prosecution time that much, then there are certain undesirable results which follow. You won't be able to research the chemical literature in chemical cases. It is unlikely you will be able to get recent foreign patents. In other words, with

patents having a very short prosecution time, well, there is just no way to search the records properly. You have left out those two very important sources of prior art.

I could try to clarify that a little bit further.

Senator HART. I think you have spelled it out understandably in here. I am following it.

Mr. WEISSMAN. Well, in chemical cases, for instance, we rely on chemical abstracts to do the searching in the chemical literature. In other words, suppose a case is allowed to go out to patent in 18 months. Now presently the indexes which we use to search the chemical literature, those indexes come out a year to a year and one-half later. The abstract itself is of no value. You can't consider that. You must have the index. In other words, we will just barely get the index by the time the patent is issued so there is no way to search that.

Now on the foreign patents, it just takes a little time until they are shipped over and until somebody looks them over—especially if they are not in English because you have to translate—and it takes time because you have to get them up to the examiners and they have to put them into the files. It all takes time. It is very haphazard, and with this shortened prosecution time we almost have a guarantee we will never see recent foreign patents. So the greatest evil of shortened prosecution time is it totally eliminates very important areas of prior art.

Now I will just briefly summarize these other sections. There are certain things the Office does. We have a manual on patent examination procedures. We have a rule of practice that says for instance, when it comes to an interview, that after the interview, a complete written record is supposed too be placed in the file wrapper so anybody can see what transpired. But yet we have what we call an office form POL-327 and I quote: "All of the claims being allowable, prosecution on the merits is closed in this application and the Notice of Allowance or other appropriate communication will be sent in due course, in view of" and then it lists the following: "telephone interview" and "personal interview."

Now, when that letter goes out, when that 327 goes out, the case is allowed so the attorney couldn't even get the written record in, or there is no necessity to get that written record in of what transpired as a result of that telephone interview even though the rules of practice definitely require that.

Of course what is even worse is that if it gets into a court contest and a judge sees that, then I don't think he is going to like the idea at all that happened. In other words, as a result of that telephone interview a case could be allowed, and yet the record would be totally devoid of the slightest indication of why it was allowed.

The next section I will just briefly go over. I feel that the Office just isn't using its personnel in the best possible manner. I think they could be a little bit more, well, I think they could be a little bit more efficient in the way they use that personnel. I will just leave it at that.

We went into the five sections that you had discussed previously.
Senator HART. Yes.

Mr. WEISSMAN. I have mentioned others just very briefly. I don't know if you want any comment on that at all except for, well, I would like to comment on a couple of things. There are some things in there which are really of interest. Your bill now requires that a primary examiner fully set forth in the record the reason for everything he does, and that is extremely interesting because the way things stand right now, Senator,, no examiner ever need explain why he allows an application. There is just nothing that requires it, and that is the reason we get a black eye so much in court. An examiner might have a very good reason for allowing it, but there is no way for him to present it. However, when it gets into a court the judge looks at it and is completely mystified. The judge can't figure out what happened. And your bill would require that everything that a primary examiner does be written in a form that the judge likes to see, you know, that no matter what he does, he sets forth findings of fact, conclusions of law, et cetera. The judge will be able to review it intelligently and see what happened. Today I believe that is one of the biggest defects in file wrappers, because no examiner ever needs to explain why he allows a case. If he tries to object to allowance he is in trouble. He has to explain. But of course when a patent gets into court there is a bad thing, because the judge would like to know what the basis was for allowing it and most of the time he just can't figure it out. As I said, the examiner might have very good reasons but they are not in there.

Now, this chapter 12, section 132(c) and subsections 1, 2, 3, and 4 very clearly spell out this must be done. Of great interest is the fact that subsection 4 also says that it would require a narrative report of all meetings between an examiner and an applicant or his representative. That relates back to what I was just discussing previously, where you could have a telephone conversation and no report of it. This provision of the bill would completely eliminate that situation.

Well, I think I have pretty well covered it. As I say, the paper itself is pretty lengthy.

Senator HART. Mr. Weissman I think that the record has benefited from having your testimony, given the background and experience from which you speak. As one interested in this particular bill I appreciate very much your individual support for it, and your comments on the five specific items that we wanted direct focus in these hearings to be on.

Mr. Brennan?

Mr. BRENNAN. No questions.

Mr. NASH. No questions.

Senator HART. Thank you.

[The statement of Milton Weissman in full follows:]

PREPARED STATEMENT OF MILTON WEISSMAN

I. INTRODUCTION

My name is Milton Weissman. I am a primary examiner in the United States Patent Office, having close to twenty-nine years of experience in patent examination, and over two years of experience in patent classification and retrieval systems. I am also Editor-In-Chief of the "Journal Of The Patent Office Society," a position which I have held since April 1967. Previously, I was the Assistant Editor of the Journal, a position to which I was appointed

in February 1963, so that I have over ten years of editorial experience in patent and related matters.

The opinions expressed in this statement are solely those of the author, and are not to be construed as having been adopted by any organization of which he is a member.

II. PATENT INVALIDITY: A CRISIS FOR THE U.S. PATENT SYSTEM

Almost all recent discussion, either written or oral, dealing with the subject of the invalidity of patents is based on the premise, either stated expressly or implied, that the courts are applying a standard of patentability which is far too strict. It is high time indeed that the opposite side of the coin be closely scrutinized. The conduct of those responsible for the issuance of patents should be questioned, and this is true regardless of whether or not one agrees that the courts are applying a too strict standard of patentability.

Do the officials of the Patent Office really care about the validity of the patents which are issued from their agency, as long as the production goals which they set for the patent examiners concerning the disposal of patent applications are met? The official position of the Patent Office is that they desire the issuance of patents of the highest possible validity. But, in view of their actual conduct concerning production goals, this position must be viewed as at least open to question. As long as the officials of the Patent Office demand greater production of disposals each year, even though the number of examiners remains about the same and the amount of prior art to be searched increases ominously each year, it is difficult indeed for anyone with an objective viewpoint to be convinced that they are paying anything more than lip service to the concept of the highest possible patent validity.

Nor are the others involved in the issuance of invalid patents to be considered entirely blameless. Do patent attorneys and their clients, the inventors, really care anything about the validity of the patents issued to them, as long as they can obtain these patents (which may or may not be valid)? Here again all concerned take the position that they only want patents of the highest possible validity to be issued. But again, in view of their actual conduct in the prosecution of patent applications, their strict adherence to this viewpoint is open to question. Is it too much to ask, for example, that they at least disclose to the Patent Office the best prior art of which they are aware? Then the examination process could be focussed on the issue of whether or not patentable subject matter has been disclosed, in view of the examiner's and applicant's best prior art, which is the best possible way to buttress the presumption of validity accorded to patents by statute.

Furthermore, the attitude of the patent bar toward any proposal for altering the present patent system, even though expressly designed to aid in the goal of having patents of greater validity issued by the Patent Office, can at best be described as merely lukewarm. Is it really too much to ask that they put aside self-interest, at least to some extent, to pursue a goal of having patents of the highest possible validity issued by the Patent Office?

The Patent Office has always had a tremendous problem, i.e., insufficient time in which to perform a proper examination of a patent application, without any solution therefor. Thus, note the following statement by Mr. Donald Brown, then Vice President and Patent Counsel of Polaroid Corp., which appeared at pp. 266-67 of "Hearings before the Subcommittee on Patents, Trademarks, and Copyrights of the Committee on the Judiciary, United States Senate, 84th Congress, 1st Sess. (1955).

"We believe that the present shortage of Patent Office personnel makes it impossible for the examiners adequately to search the art if the work of the Office is to be kept on a reasonably current footing. For example, it is our common practice, even in fields in which we are reasonably expert, to search the art before introducing a new product commercially. These searches, which are usually limited to United States patents of the last 15 or 20 years, may average 4 to 5 days of 1 man's time. An exhaustive literature search, such as we make if we are charged with infringement of another's patent, may run from 10 to 20 days of 1 man's time or even longer. As opposed to this, it is our understanding that the Patent Office's examiners, on the average, can devote not more than one-half day to the preparation of each Office action. . . . We do not believe that it is possible, even for a skilled examiner familiar with

the art, to make an adequate search and to consider a new specification or a fairly complete amendment within a period of 3 or 4 hours. . . . We feel that today much of the technical literature is not searched by the Patent Office examiners. We know that our own searches invariably develop references which we believe are closer than those developed by the Office."

Since at that time a patent application normally received 3 Office actions, the last one being final, it received about 12 hours of examination by the Patent Office. From those figures it should be quite evident what basically is the cause of patent invalidity. It is extremely interesting to note that at the present time patent applications receive the same inadequate type of examination.

Patent applications are presently filed at the rate of about 90,000-100,000 per year. To keep the backlog at the same level at least this number of patent applications must be disposed of annually by the Patent Office, i.e., by allowance or abandonment. Because of various factors such as leave, etc., assuming that an examiner works 1650 hours per annum, a typical GS-13 examiner without signatory authority is expected to obtain 110 disposals per annum. This averages out to 15 hours/disposal. The situation is far worse with respect to a typical GS-15 examiner, having a full signatory authority, who is expected to obtain as high as 147 disposals with an average of 11.5 hours/disposal. Any comment that this represents adequate examination of a patent application is woefully inadequate.

III. THE U.S. PATENT OFFICE: ITS ROLE IN FOSTERING PATENT INVALIDITY

Much has been written recently concerning the causes of patent invalidity, but practically nothing relates to the role of the Patent Office in fostering patent invalidity. Only a few scattered comments can be found in the legal literature, such as the following:

"[The Patent Office has got to be the sickest institution that our Government has ever invented. It is just as far as I can see an attritional war between the patent applicant and the patent examiner who apparently got paid on the piece work for how many patents they could put out." Judge Miles W. Lord, September 8, 1971, *United States v. Charles Pfizer & Co., Inc.*, et al, (Tetracycline civil damage suit), 4-71 Civ 435 (D. Minn.).

What exactly is going on in the Patent Office that would cause a judge in a Federal District Court to place such a vitriolic comment in the record of a legal controversy?

It should hardly surprise anyone that the Patent Office, operating under present practices and procedures, is at least one of the prime causes for patent invalidity. There is also hardly any question that some of the practices are a result of the demands made upon the Patent Office with respect to decreasing, or at least maintaining at the same level, the backlog of unexamined applications. But the question here is simply whether or not there can be any justification for the practices and procedures employed by the Patent Office in order to meet the demands made, regardless of what they may be, when it is glaringly apparent that they must inevitably result in a flood of invalid patents. Exactly what are the practices and procedures, and why must they foster patent invalidity?

A. The Quota System

What is involved in any quota system is always a subordination of quality to quantity in order to meet some production goal. This is true even on an automobile assembly line. But the quota system in the Patent Office goes far beyond this. It is not merely a question of subordinating quality to quantity in order to meet a production goal. What is involved is a total obliteration of the concept that there can even be a requirement of quality, regardless of how low it may be, in the examination of patent applications. It is hardly any wonder that examiners refuse to become concerned with the quality of the examination they perform, when the result thereof will be punishment, not reward. How can such a system do anything but foster invalid patents?

1. The numbers game

The quota system has produced many strange results. Examiner productivity is measured in terms of the number of cases he allows, the number of cases which become abandoned (these two together are considered disposals) and,

strangely enough, the number of new cases he acts on. Abandonments can hardly be controlled. The prime factor in productivity is therefore allowances, because they are easiest. The temptation for an examiner to allow a case, when he must meet a production goal, is almost unbearable. The validity of any patent issued under such circumstances is highly suspect. But there is even a greater evil involved. If an examiner allows a new case on the first action, he then gets double credit, i.e., one credit for acting on a new case and one credit for allowing the identical case. In other words, he need work only half as hard as any other examiner and attain the same production rating. If an examiner is not meeting his quota because he is low on allowances and low on abandonments, he can then resort to the expedient of making up the deficiency, at least temporarily, by acting on a sufficient number of new cases. Normally speaking, an action on a new case is the most time consuming one, involving an understanding of the specification and claims, searching the prior art, writing on Office action, etc. If an examiner resorts to this expedient in order to meet his production quota, the time he spends on each new case is severely curtailed and the quality of the examination thereof must inevitably be lowered.

2. Superficial treatment of the most complex cases

Another equally strange result of the quota system is that the most complex cases receive the least thorough prosecution, a practice which must inevitably result in the issuance of invalid patents. How could such an obviously destructive practice arise, and, even further, how can it be permitted to continue unabated? The answer to these questions is simple: it is the result of a quota system administered in a manner which borders on absurdity.

The key here is complexity, i.e., obviously some cases require more time for examination than others. But the simplest way to administer a quota system is to make the absurd assumption that all cases are of the same level of complexity. Thus, in any examining group all cases are assumed to be of the same order of complexity, even if more than fifty examiners are involved. Cases involving nothing more, for example, than making a mixture of metals useful as an alloy (Exhibit A) are deemed to be as complex as cases involving the production of synthetic diamonds (Exhibit B). An example of other equally complex cases is the production of exotic boron containing compounds (Exhibit C).

If the officials of the Patent Office were to be questioned on this issue, they would undoubtedly answer that different arts have received different complexity factors. However, these factors appear to be purely mythical because no examiner has ever been told exactly what is the complexity factor for his particular docket. Even if such complexity factors did exist, they certainly did not arise as the result of any legitimate statistical study. It is not too well known, but they arose as the result of politics. The officials having the most influence got the best deal they could, i.e., an assignment of a complexity level as high as possible, for the examiners under them so that they (the officials) personally could benefit by having a lower case load assigned to them. In the not too far distant past all examiners (Office-wide) were adjudged to have cases of exactly the same complexity, and their efficiency was measured by the number of Office actions they produced per week. There is nothing to lead one to believe that the present system really differs in essence from the former system.

3. Misuse of computer resources

Perhaps the strangest result of the quota system is the use of extremely expensive computer time to keep production records on examiners which are complete to the n^{th} degree. Production records show, for well over 1000 examiners, such diverse factors as the number of new cases acted on, the number of allowances, the number of abandonments, etc. They also include such other esoteric items as balanced disposals, hours per balanced disposal, and so on, ad infinitum. What possible justification can there be for employing valuable computer time to compile this mountain of production records, essentially nothing but a mass of trivia, and not of the slightest consequence when pursuing a goal of processing patent applications to produce patents of the highest possible validity.

In view of the urgent necessity of finding some way to employ computers to aid an examiner in the examination of patent applications, the spectacle of

employing a computer for nothing more useful than the compilation of infinitely detailed production records is almost ludicrous. Admittedly, no one has yet demonstrated how to successfully employ a computer to completely search all patent applications. But progress has been made in employing computers for search purposes, particularly in the area of the chemical arts and particularly by the British Patent Office. If the U.S. Patent Office is not aware of this, there is no excuse therefor. Further, all domestic patents in a recently revised chemical class (Class 423) are completely coded at least as to process conditions employed. All that remains to be done is to place this information into an information retrieval system, e.g., a computer. Three years at least have gone by since this coding project was completed, and nothing has been done with it. And during all of this period computer time available to the U.S. Patent Office has been employed for nothing more useful than the creation of examiner production records. There certainly appears to be a complete misunderstanding here of exactly what projects should receive priority with respect to the use of computer time.

4. *The bounty system*

Any quota system must inevitably lower the quality of the product which is produced under it. Just taken by itself the devastating effects it produces are cause enough for alarm. But the U.S. Patent Office has succeeded in adding even one more refinement which serves to lower the quality of the product produced under its quota system still further. This is the bounty system, i.e., an extra reward for exceeding an assigned quota which by itself leads to a lower quality product.

The system employed here is very simple. If an examiner succeeds in exceeding his assigned quota by 10 percent, he then receives a bounty of \$350.00. The total number of hours he spends per annum in examination of applications is still the same, so that the end result must be less time spent on examining each case. The resultant quality of the product is thus lowered even more. This is not a trivial issue. According to one published report this bounty system was the cause of much wrangling between the former Commissioner of Patents, Gottschalk, who wanted to abolish this system, and the former Assistant Commissioner, Wahl, who favored it. *Chemical Week*, August 1, 1973 page 13. [Exhibit D].

B. Lack of a Meaningful File Wrapper Record

The determination of the validity of a patent in a court proceeding is obviously very much dependent upon the nature of the file wrapper record. It desirably should be complete as possible. All possible issues concerning the validity thereof should have been thoroughly explored. The best prior art should have been cited and applied, and a clear case for the allowability of the patent claims over this prior art should have been set forth in the record. This is the ideal. What is the reality? Obviously file wrapper records in the past approached the ideal with varying degrees of success. But the present trend in Patent Office procedures does not serve to improve the file wrapper record: if anything, it degrades it so that it has minimal value.

Changes in practice in the Patent Office in recent years have had only one effect, i.e., they have only served to impair even more whatever value a file wrapper record might have in a court for determining the validity of a contested patent. Only two of these practices will be discussed here, i.e., (1) the use of the PO-1142 in the first Office action, and (2) the insistence of the Patent Office that the time for prosecution of a case be shortened by insisting that all amendments be acted on within two months of receipt and further that all second actions be made final. See Exhibit E for details. These two practices taken together have materially lowered whatever chance there might be for a patent to be held valid in a court proceeding. The result thereof is only a mere skeleton of an administrative proceeding; there is no flesh on the bones.

1. *The PO-1142 form*

The criticisms which have been made of this first Office action are many; see Woodbridge, "PO-1142," 54 JPOS 429 (July 1972). [Exhibit F]. The only thing that need concern us here is the effect of the PO-1142 form upon the validity of an issued patent. Its effect can be considered nothing less than disastrous. As pointed out by Woodbridge, a major fault thereof is brevity. One simply cannot explore legal issues, such as the application of 35 U.S.C. 103, in

a single sentence or even two sentences, which is about all that the PO-1142 will permit and all that the Manual of Patent Examining Procedure recommends. [Exhibit G]. If a patent is issued with only a PO-1142 first Office action and an applicant's response thereto in the file wrapper record, this hardly aids in buttressing the presumption of validity accorded by statute to issued patents. If the PO-1142 fails to clearly point out the issues involved, which it can hardly do in view of its brevity, there is lack of opportunity for a patent applicant to present a clear and convincing case for the patentability of his claims. There cannot be much doubt as to what will happen to a patent with such a file wrapper record, when one considers the hostility of judges to patents with much better supporting records.

The exact reasons for the adoption of the PO-1142 by the Patent Office have apparently never been made public. But clearly it was intended to save examiner time, if nothing else, so that he could more easily attain the production goals set for him. Therefore, the issue to be decided again is whether or not satisfaction of production goals is to be permitted to emasculate a file wrapper record to impotency.

2. The insistence of the Patent Office on shortening prosecution time

Note the following statement by former Commissioner of Patents Gottschalk (page 6 of Exhibit H) :

"It might seem to some that we are shooting for two inconsistent goals: A meaningful examination and the issuance of strong patents on one hand, and on the other, the accomplishment of this process in a short period of time.

"I want to emphasize, however, that in our effort to reduce pendency, we do not intend to sacrifice the development of an adequate record of all important issues, or meaningful examination, or justice and fair treatment for the applicant. On the contrary, I believe we can cut down on pendency time without adverse effect on the examination process."

The difficulty here is that just *how* these desirable results can be obtained in a shorter pendency time, without adverse effect on the examination process, is never spelled out. And it would appear to any reasonably objective person that, for reasons more fully developed below, shortening of pendency time must inevitably lead to the issuance of invalid patents.

One could advance many sound reasons for shortening the pendency of an application in the Patent Office, e.g., advancing the date of expiration of the monopoly which has been granted. But it does not appear that this is the real reason why the Patent Office has adopted a policy of shortened pendency time. It is very likely that the real reason for this policy is not that discussed above, but rather may be that the Patent Cooperation Treaty cannot be ratified unless all U.S. Patents are either issued as patents or become abandoned within 18 months from the date of filing.

Commissioner Gottschalk in his May 31, 1972 Memorandum for ALL Employees stated :

" *** it is desirable as a practical matter, that our average pendency for patent applications be down to about eighteen months before we implement the Patent Cooperation Treaty. *** We are striving to reach an eighteen month average pendency goal by the end of Fiscal '75".

The PCT requires publication of all still pending patent applications within 18 months of filing. This cannot be done under present U.S. law; 35 U.S.C. 122 forbids this. And so the U.S. Patent Office is attempting to demonstrate that all cases can be allowed or abandoned in 18 months, whereby the PCT can be ratified even under existing U.S. patent law. Exactly why this should be a desirable goal is far from clear, especially when it is realized that shortened prosecution time inevitably lessens the possibility that the patents issued will be valid. The price to be paid appears to be too high merely for the sake of international cooperation.

The greatest defect of shortened prosecution time is that it practically eliminates all recent literature references and recent foreign patents as possible sources of prior art against patent applications; such recent material is of extremely great value. Literature references cannot be searched as such; reliance must be placed on abstracting services and, more specifically, the literature abstracts and indexes they issue. Again, it is useless to attempt to search abstracts themselves. The search indexes must be available to do this. And this is wherein the defectiveness of shortened prosecution resides. There is a great

time lag in the issuance of the search index, for example, presently from 1 to 1½ years with respect to chemical abstracts. See Exhibit J. The Office goal for Fiscal Year 1975 is to attain initial examination of an application within 6 months of filing, even less than the present 10.5 months. A literature search cannot be made under these circumstances.

The other material defect of shortened prosecution time is that it will positively eliminate consideration of nearly all recently issued foreign patents, especially those not written in English. Foreign patents do not appear in an examiner's search files instantaneously. It takes much time until they are transmitted here from abroad, and are processed through the Scientific Library, e.g., to have an English abstract affixed thereto or a translation of at least one claim (for what it is worth). There must then be a determination of where to place it in the examiner's search files. This procedure is presently haphazard at best; shortened prosecution time will act as a guarantee that they will never be considered at all.

C. Obviously Illegal Practices

It is certainly well established that the Rules of Practice have the force of law if not contrary to statutory law, and they must be observed not only by applicants for patents but also by the Patent Office itself. However, it is quite apparent that the Patent Office does ignore these Rules of Practice, and the result therefore, of course, cannot be anything but an invalid patent. These violations of the Rules of Practice range from the obviously illegal to the not obviously illegal, but which reasonably objective persons would agree constitute a non-observance of the Rules of Practice. In any event it is apparent that any patent issued, in which nonobservance of the Rules of Practice was involved, can readily be held to be invalid by a court.

As an example of a clear violation of the Rules of Practice, attention is directed to the Office Form POL-327. Note the following extract therefrom:

"4. All of the claims being allowable, prosecution on the merits is closed in this application and the Notice of Allowance or other appropriate communication will be sent in due course, in view of:

- b. Telephone interview with ----- on -----.
- c. Personal interview with ----- on -----."

Rule 133(b) states: "In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant."

Since prosecution is closed and the case stands allowed by the POL-327, there is not even any need to comply with Rule 133(b); the violation of the Rule is indisputable.

D. Misplaced, Unqualified and Unnecessary Highly Paid Personnel, etc.

It hardly seems open to debate that the actual examination of patent applications should be conducted by those most qualified to do so, in order to ensure the highest possible validity for the patents which are issued by the Patent Office. The higher officials should actively assist in attaining this goal of valid patents. The disregard of these principles by the administrative officials of the Patent Office is blatant.

1. Legal training

It seems evident without debate that patent examiners perform a quasi-legal function. The desirability of legal training for examiners, and especially those of primary grade who operate without any kind of review of their work product, is considered to be self-evident. But the Patent Office does not pay the slightest attention to this type of training.

Up until about 1960 it was required, in order to attain the grade of primary examiner, that the candidate therefor must have at least obtained a law degree. Bar membership was considered desirable, but not a necessity. Thereafter the requirement that primary examiners must have at least a law degree was abolished. There are at least two hundred examiners in the U.S. Patent Office who are primary examiners. Although exact figures are not easily obtainable, it is well known that only a very small minority of these primary examiners have a law degree. It would hardly appear, even to a layman, that

this is the best course to pursue. Change of some kind clearly appears to be necessary here.

But the policy of the Patent Office with respect to legal training goes far beyond what has been discussed above. Promotion to a higher grade in the Patent Office is dependent upon many factors, called extra credit items. An example of this is an extra credit rating when an examiner can demonstrate that he has the knowledge, and applies it in the examination of cases, equivalent to that obtainable only by advanced training in technology, e.g., a masters degree, etc. What is the status of a law degree in the promotion scheme of the Patent Office? It is worth exactly nothing. Such a policy serves only to drive out of the Patent Office those with extremely desirable training, and encourages only those to stay who are obviously not the best qualified to be primary examiners.

2. Technological training

In foreign patent offices it is not at all unusual to find that they require that an examiner have had previous experience in the technical field in which he desires to examine patent applications. In the U.S. Patent Office the situation is quite the reverse. It is not merely that the U.S. Patent Office does not have any such requirement as stated above. Rather, it is not unusual to find that many primary examiners, and especially supervisory primary examiners, do not even have a scientific or engineering degree in the particular field in which they operate in the Patent Office. Thus, it is far from unusual to find examiners in the chemical arts who have no degree in chemistry or chemical engineering, examiners in metallurgical arts who have had no metallurgical training, etc. The reason that this occurs, especially with respect to supervisory primary examiners, is that they are chosen primarily on the basis of the impressiveness of the production records they have achieved while examining patent applications. Their particular background, i.e., the scientific or engineering degree they possess, is of little or no significance when being considered for promotion. Even if a supervisory primary examiner has an engineering or scientific degree in the proper field, he still seldom has had any previous experience with the particular subject matter of which he is placed in charge. Most supervisory primary examiners come from an entirely different, and, in many cases, totally unrelated art area. But high production must be rewarded, regardless of the consequences.

3. Highly paid but unnecessary personnel

The U.S. Patent Office has many highly paid officers in the upper echelon, and, in many cases, it is extremely difficult to ascertain just what useful function they perform. They certainly appear to do nothing to assist the U.S. Patent Office in attaining the goal of issuing patents of the highest possible validity.

The author has no desire to point a finger at any particular position in the Patent Office, but the position of Group Director, of which there are presently 14 having salary requirements in the area of \$500,000. Is a good example. The Commissioner does delegate to them rendering decisions on various petitions, but this can hardly serve to justify the position. It appears to the author that their primary function is simply to administer the quota system, and with deemphasis of this system it would appear that the position would then be of negligible importance. They certainly could be more usefully employed in various areas in need of assistance such as, for example, the Board of Appeals. At least in this manner they certainly would be more usefully employed in assisting in accomplishing the goal of having the U.S. Patent Office issue patents of greater validity. Of course, this is considered to be only one illustrative way in which they could be of assistance. There are many other possibilities related to patent validity, e.g., conducting educational courses for primary examiners to keep them abreast of the rapidly changing doctrines of patent law, etc.

IV. HOW CAN THE PATENT OFFICE BE ASSISTED?

In concluding this statement it is considered appropriate to examine in detail how at least some of the provisions of S.1321 could assist the U.S. Patent Office in issuing patents which would stand a far better chance, when involved in a court test, of being adjudged to be valid patents.

It is considered to be evident that the main deterrent to the issuance of

valid patents by the U.S. Patent Office is the lack of sufficient time in which to do a thorough job of examination. It must be admitted that many of the time-saving but ill-considered practices employed by the U.S. Patent Office are the result of an inexorable pressure, coming from outside the Office, for either maintaining the backlog of unexamined applications at the same level or reducing it. The most obvious procedure is of course (1) to permit more time for the examination of a patent application. Another alternative (2) is a reduction in the number of applications to be examined per year. Finally, (3) every means for enabling an examiner to produce the best possible product without an increase in the time which can be allocated for the examination of each case must be considered. S. 1321 has many provisions that would appear to offer much assistance to the U.S. Patent Office in achieving all three of these objectives.

A. Opposition Proceedings

Chapter 12, Section 135

S. 1321 offers an extremely desirable form of assistance to the U.S. Patent Office for locating the best prior art, i.e., opposition proceedings. It is very difficult to understand why there can be such an adverse emotional reaction by many to a proposal of this nature. It should be evident that a proceeding of this kind, regardless of its faults, will greatly assist an examiner in obtaining the best possible prior art to be applied without the expenditure of additional time on his part in locating it. A proceeding of this nature will greatly assist an examiner to do the best possible job in the time period allocated for the examination of an application. Whatever the faults of such a system may be, they surely can be mitigated by adequate safeguards.

B. Deferred Examination

Chapter 18, section 191, 192, 193

The reason why this part of S. 1321 would greatly assist the U.S. Patent Office in issuing more valid patents is based on the fact that under present practice after the payment of the initial filing fee, each application is entitled to a full examination procedure. Most applications are maintained until final rejection thereof. This entire practice is based on a very faulty premise. Is it not more reasonable to assume that if an applicant must pay an additional fee for each stage in a full examination, not all applications will have to be completely examined. This part of S. 1321 is based on the premise that requests for full examination will not be made in all applications filed for financial or other reasons. Therefore, if a smaller number of applications is to be examined per year, i.e., the case load on the U.S. Patent Office is decreased, it will then be possible to do a more thorough job on those applications which are fully examined. Thereby patents will be issued which have a better chance of being adjudged valid.

Many have advanced the argument that these provisions of S. 1321 will not have the desired effect of avoiding full examination of all applications, i.e., requests for full examination will be received in all applications filed. In order to attain the objectives of this portion of S. 1321 it could be modified so as to incorporate therein a provision for the prompt issuance of a brief patentability report, perhaps incorporated in the PO-1142 form previously referred to. This would not be too time consuming on the part of examiners, and conceivably it could result in the abandonment of many applications without the expenditure of the time required by the full examination procedure.

C. Maintenance Fees

Chapter 4, section 41

This part of S. 1321 may have a very great effect on the thoroughness with which a patent application may be examined. Its purpose is quite obviously to tap a source of fees which the U.S. Patent Office at present does not have, and which will be collected from those best able to pay for it, i.e., those who find an issued patent to be profitable. With an increased income the U.S. Patent Office could conceivably be expanded, and with more examiners acting on the same caseload the result would be that an examiner could spend more time on each application which he examines. Another great benefit accruing from increased funds could be a thorough overhaul of the manual classification system, resulting in better searches of the prior art in a shorter time.

*D. Independent Agency Status**Chapter 1, section 2*

This part of S. 1321 proposes conversion of the U.S. Patent Office to an independent agency. In view of the fact that the U.S. Patent Office clearly performs a quasi-judicial function, and that most, if not all, of other U.S. agencies performing a quasi-judicial function have independent status, the continuance thereof under the jurisdiction of the Department of Commerce can only be viewed with amazement. The reason for conferring independent status on any agency performing a quasi-judicial function is apparent. In the same manner as with respect to any judge, those officers of the U.S. Government performing quasi-judicial functions must be free to perform them without being subject to political or any other kind of pressure. If the U.S. Patent Office is accorded independent agency status, then perhaps the officials thereof will not feel compelled to resort to the various practices and procedures referred to above which make for an impressive production record, but which hardly serve to produce quality patents able to stand up to a court scrutiny of their validity.

*E. Public Counsel**Chapter 1, Section 3(d)*

This section is devoted to establishing an officer, who is like the present Assistant Commissioner for Appeals, Legislation and Trademarks, but in addition has been given many new powers, such as, for example, the power to subpoena, the power to institute a discovery proceeding, etc. What is the reason for these provisions? Although it is not too widely known, many patents are invalidated in a court proceeding upon grounds which the U.S. Patent Office at present simply has no good means for reviewing. It cannot do so because of the lack of the powers mentioned above, and at least part of the thought behind this section is to enable the U.S. Patent Office to thoroughly investigate all possible grounds for invalidity before a patent is actually issued. It makes far more sense to conduct the examination of a patent application in this manner, rather than to leave totally unexamined and solely for court review a number of issues which can easily serve to invalidate a patent.

For example, under present Rule of Practice 292, it is possible to have a public use proceeding before the issuance of a patent. But the provisions of this Rule are so restrictive that the institution of such a proceeding in the U.S. Patent Office is a virtual rarity. If there were a public counsel as provided for by S. 1321, he could easily use his new powers to thoroughly investigate this issue. This would clearly follow if he had reasonable grounds to believe that public use or sale had occurred which could be a possible ground of invalidity if a patent were to be issued.

*F. Nonsecrecy for Patent Applications**Chapter 11, section 122*

This section of S. 1321 should be of great benefit to the U.S. Patent Office because it will completely obviate the necessity (imaginary or not) to attain either allowance or abandonment of a patent application before the termination of an eighteen month period from the date of filing thereof. The reason for this policy has been referred to above, i.e., ratification of the PCT under existing law, with the consequent dilution and degradation of the examination of applications which must necessarily ensue when following a policy as short-sighted as this one. Section 122 requires publication of a pending application before the date of the first examination thereof; this, of course, permits publication within 18 months of the filing date, which is in accordance with the PCT.

G. Other Pertinent Sections of S. 1321

In order to shorten this statement brief reference is made below to various other portions of S. 1321 which, in the opinion of the author, would materially assist the Patent Office in issuing patents of the highest possible validity.

As to the examination procedure itself note the following.

Chapter 12, Section 131(b)

(1) Would require an applicant to submit to the Patent Office all prior art considered in connection with the application for patent, and

(2) Would require an explanation as to why the claims presented in the application are considered to be patentable over this prior art.

The above matter relates of course to the hotly debated subject which can be summed up as the patentability brief.

Chapters 12, Section 132(c), Subsections (1), (2), (3) and (4)

(1) Would require a primary examiner to prepare all of his decisions in the usual manner found acceptable by a court of law, i.e., findings of fact and conclusions of law, so that the reasons for his decision are apparent and can be subjected to a rational process of review, and

(2) would require a narrative report of all meetings between an examiner and an applicant or his representatives.

The reason for the first of these provisions is that at present an examiner need not state in the record why he allowed an application to become a patent, and trying to determine his reason therefor is at best a guessing game. This hardly can lead to a rational review of his decision. The reason for the second provision is of course subsidiary to the first, i.e., to provide a complete record of everything which transpired in the prosecution of a case and to avoid guessing games.

Chapter 13, section 115(a), Subsections (1), (2) and (3)

(1) Would require applicants and their attorneys, after notice of allowance, to affirm that they are not aware of any more pertinent art than that considered by the Patent Office in its examination of an application, and

(2) Would further require them to affirm that they are not aware of any public use bar to patentability, or any other material information which would adversely affect the issuance of a patent.

The reason for these provisions is in the interest of objectivity. Before an application is actually subjected to an examination procedure it would be very difficult to ascertain exactly what prior art, etc., is really material, but it certainly is not as difficult to do so once the Patent Office has, so to speak, put its best foot forward.

The following sections would focus attention on the problems relating to the validity of issued patents, and what recommendations could be made with the purpose of improving said validity.

Chapter 1, section 9

This would require an evaluation by the Commissioner of Patents of the overall quality of the patents issued (including court decisions related to the validity and enforcement of patents).

Chapter 1, section 10

This would require an Advisory Council on the Patent System to study and appraise the methods and operations of the U.S. Patent Office including the quality of U.S. patents.

The purpose of these provisions is to require the Patent Office to be aware of the quality of its product, which has been grossly neglected in the past.

To assist the Patent Office in shortening the time required for searching the prior art the following provisions are of interest.

Chapter 1, section 6(c)

This would require by statute not only that the Commissioner of Patents revise the manual classification system as required, but also would make mandatory the incorporation therein of both foreign patents and all literature references (which was not previously required).

Chapter 1, section 6(e)

This would provide statutory support for all efforts designed to facilitate searching by the U.S. Patent Office by whatever assistance mechanization of searching could afford.

Both of these provisions are intended to attain the objective of cutting down search time, thereby permitting the time saved to be more profitably employed in the actual examination process so that patents of greater validity can be issued.

V. CONCLUSION

In conclusion, it appears pertinent to point out that the U.S. Patent Office has been in the business of examining patent examinations since 1836, and therefore has 138 years of experience behind it. If one believes that the U.S. Patent Office today is failing to discharge its function of examining patent applications in a satisfactory manner, then the remedy is not, as many would appear to assume, to simply discard all of this accumulated experience. What clearly must be done is to modify the present examination system in such a manner that the U.S. Patent Office will at least be in a position in which it has a fighting chance to discharge its obligations in a satisfactory manner. If after such changes are made it still fails to discharge its obligations in a satisfactory manner, then perhaps it would be appropriate to consider its demise.

Exhibit A

UNITED STATES PATENT OFFICE—3,464,816, PATENTED SEPT. 2, 1969
3,464,816

ALUMINUM MASTER ALLOYS

Richard Hampton Biddulph, Surrey, England, assignor to United States Borax & Chemical Corporation, Los Angeles, Calif.

No Drawing. Filed Feb. 25, 1966, Ser. No. 529,941

Claims priority, application Great Britain, Mar. 4, 1965,

9,279/65

Int. Cl. C22c 21/00

U.S. CL. 75—135

9 CLAIMS

ABSTRACT OF THE DISCLOSURE

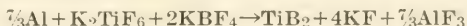
Aluminum master alloys, containing *finely divided transition metal boride* dispersed throughout the aluminum, are prepared by forming a molten mixture of aluminum, a transition metal boride and a flux and cooling the molten mixture. The flux is an inorganic flouride which assists in the wetting of the boride with the aluminum.

This invention relates to aluminum alloys containing a finely divided metal boride, and to the preparation of said alloys useful in the production of fine grain aluminum.

It is known that the presence of up to about 100 p.p.m. by weight of a metallic boride having a hexagonal structure, such as the transition metal borides, confers a fine grain structure on cast aluminum, which is of great importance when the aluminum is to be rolled into sheet or foil. In general, these borides should be used in the form of fine powders as their effectiveness depends upon the number of particles present; and moreover, large particle are abrasive and lead to inhomogeneity.

In practice, it is virtually impossible to add the requisite very small quantity of a finely divided boride to molten aluminum without the former being oxidized during the addition, and rendered ineffective as a grain refining agent. To overcome this difficulty it is customary to prepare a master alloy of

aluminum containing boron, and titanium or another metal which will form a hexagonal boride, said alloy being in the form of the elements, or the boride, or a mixture of the two, and to use this alloy as a source of boride in the preparation of fine grain aluminum. Such master alloys contain for instance, from 0.5 to about 10% or more, by weight of boride. Hitherto, these master alloys have been made by the reaction of aluminum with a mixture of complex fluorides of the metal from which the boride is derived and of boron. An example of one such process is:



However, this process is expensive and relatively inefficient, and the product contains an undesirably high proportion of coarse particles.

We have now found that finely divided borides, such as of *particle size less than about 5 microns*, can be evenly dispersed in aluminum to form a master alloy by means of the use of a suitable flux which causes the boride to be thoroughly wetted by the aluminum. The use of the flux also serves to prevent the oxidation of the finely divided particles of boride.

Accordingly the present invention comprises in one aspect a process for the preparation of a master aluminum alloy which comprises forming a molten mixture of aluminum, a finely divided metal boride, and a flux, said flux comprising a fluoride which assists in the wetting of the boride with the aluminum. Metal borides which can be used are the transition metal borides, such as titanium diboride, chromium diboride, zirconium diboride and vanadium diboride, and preferably those capable of existing in a hexagonal form.

The fluxes which have been found to be particularly effective are complex halides, especially the inorganic fluorides such as K_2ZrF_6 , K_2TiF_6 , Na_3AlF_6 , potassium fluoride, and mixtures of potassium fluoride with potassium chloride or with potassium iodide or with a mixture of the two. In general, any complex halide or mixture of halides containing a fluoride as one component which causes the boride being used to become wetted by aluminum can be used. The amount of flux used is not narrowly critical, varying from as little as about one hundredth of the weight of boride to an amount equal to the weight of the boride. Preferably, at least about one tenth of the weight of the boride is used.

The aluminum master alloy can be made, for instance, by mixing the finely divided boride with the flux, and blending the mixture with molten aluminum. Alternatively, the mixture of the flux and boride can be heated with solid aluminum until the metal melts, and then the mixture is stirred. On cooling, a solid master alloy containing the finely divided boride dispersed throughout is obtained. This in turn can be added to larger quantities of molten aluminum in order to obtain a final product containing, for example, up to about 100 p.p.m. of the boride in a form which results in the final cast aluminum product to be fine grained.

The resultant alloy contains boride of a known and controlled particle size evenly dispersed throughout the aluminum. Such alloys are far superior to previous master alloys which contain particles of widely varying sizes and of uncontrolled distribution.

The invention is illustrated by the following examples, but it is to be understood that my invention is not restricted to the specific examples given.

EXAMPLE I

Ten grams of titanium diboride having a mean particle size of 2.5 microns was mixed with six grams of potassium hexafluorozirconate and placed in an alumina crucible. Ninety grams of aluminum in a single piece was placed on top of the mixture and the crucible was heated until the aluminum and the flux had melted. The mixture was stirred and allowed to cool. The solid prod-

uct, obtained after being freed from excess flux by washing with water, contained 9.5% of finely divided titanium diboride evenly dispersed throughout the aluminum.

EXAMPLE II

The procedure of Example I was repeated using 7.5 grams of titanium diboride, 2.5 grams of sodium aluminum fluoride (cryolite) and 100 grams of aluminum. A master alloy containing at least 95% of the titanium diboride evenly dispersed in aluminum was obtained.

EXAMPLE III

The procedure of Example I was repeated using 7.5 grams of chromium diboride, 2.5 grams of a 1:1, by weight, mixture of potassium fluoride and potassium iodide, and 100 grams of aluminum. A master alloy containing at least 95% of the chromium diboride evenly dispersed in aluminum was obtained.

EXAMPLE IV

The procedure of Example I was repeated using 7.5 grams of zirconium diboride, 2.5 grams of sodium aluminum fluoride and 100 grams of aluminum. The resultant master alloy contained at least 95% of the zirconium diboride evenly dispersed in the aluminum.

Similar results were obtained using 2.5 grams of potassium fluoride as flux instead of the sodium aluminum fluoride.

What is claimed is:

1. The process for the preparation of a master aluminum alloy which comprises forming a molten mixture of aluminum, a finely divided transition metal boride and a flux, and cooling said molten mixture to form a master aluminum alloy having said transition metal boride dispersed throughout said aluminum, said flux comprising an inorganic fluoride which assists in the wetting of said boride with said aluminum.

2. The process according to claim 1 wherein said finely divided boride and said flux are mixed and then blended with molten aluminum.

3. The process according to claim 1 wherein said aluminum, said boride and said flux are heated until the metal melts and the mixture is stirred to disperse the boride throughout the aluminum.

4. The process according to claim 1 wherein said boride has a hexagonal structure.

5. The process according to claim 1 wherein said boride is titanium diboride.

6. The process according to claim 1 wherein said flux is potassium hexafluorozirconate.

7. The process according to claim 1 wherein said flux is sodium aluminum fluoride.

8. The process according to claim 1 wherein the amount of flux is from about one tenth to an equivalent amount, by weight, of said boride.

9. The process according to claim 1 in which said boride is chromium diboride.

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RICHARD O. DEAN, Primary Examiner			

U.S. Cl. X.R.

Exhibit B

Jan. 6, 1970

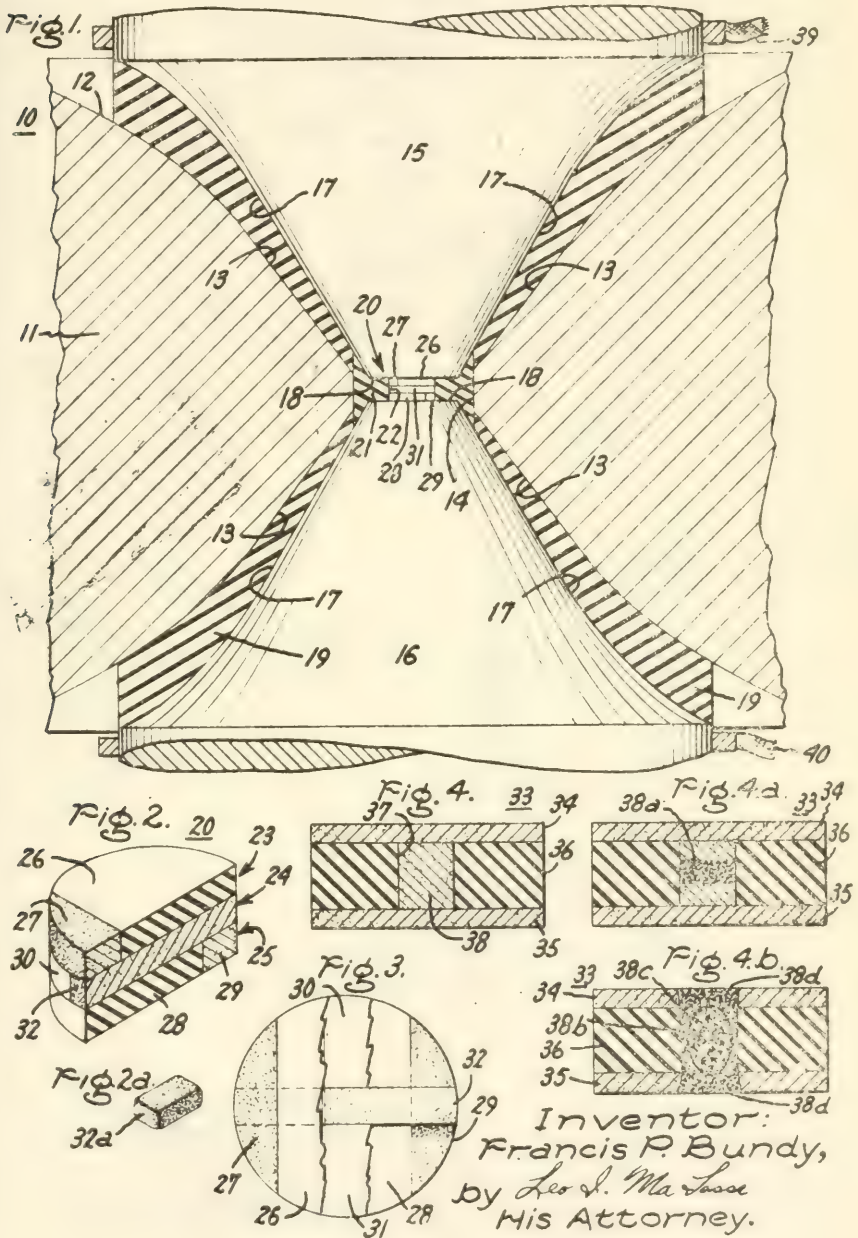
F. P. BUNDY

3,488,153

NON-CATALYTICALLY PRODUCED CUBIC AND HEXAGONAL DIAMOND

Filed Dec. 1, 1966

4 Sheets-Sheet 1



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Jan. 6, 1970

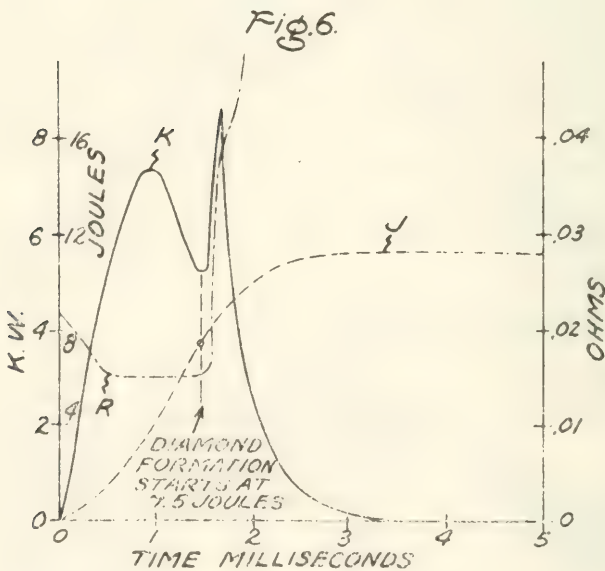
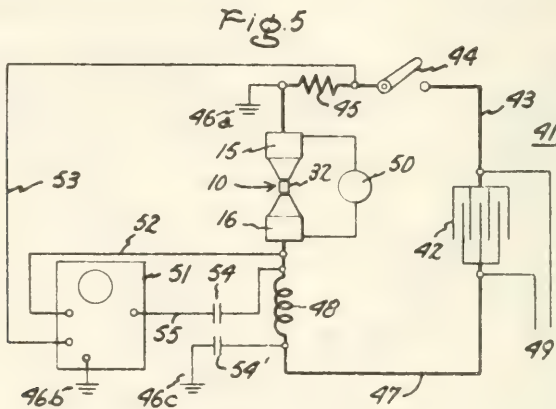
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3,488,153

NON-CATALYTICALLY PRODUCED CUBIC AND HEXAGONAL DIAMOND

Filed Dec. 1, 1966

4 Sheets-Sheet 2



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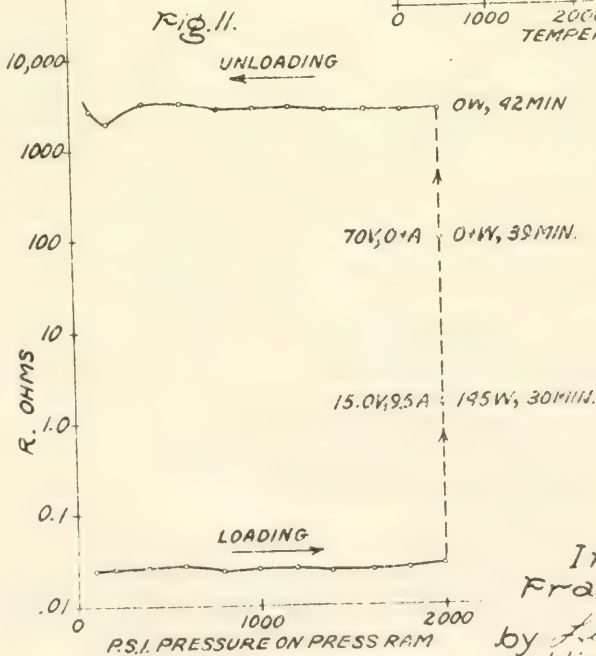
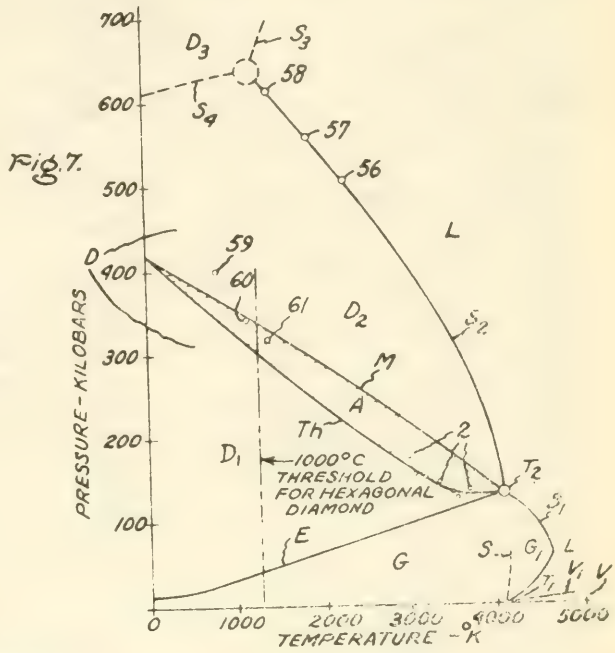
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3,488,153

NON-CATALYTICALLY PRODUCED CUBIC AND HEXAGONAL DIAMOND

Filed Dec. 1, 1966

4 Sheets-Sheet 3



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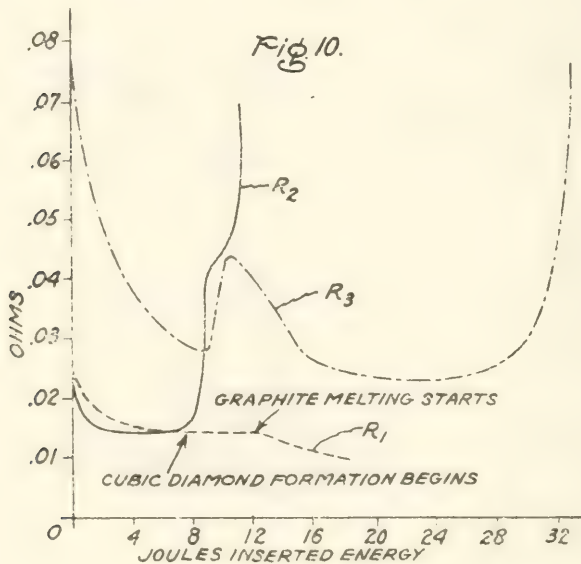
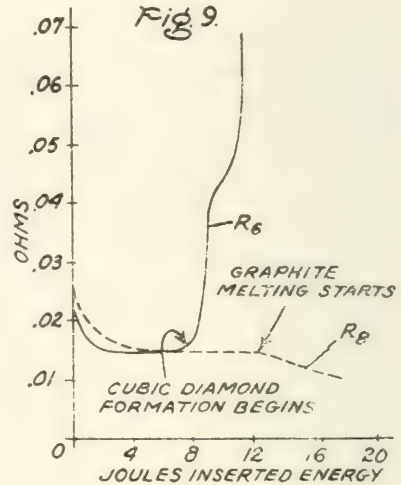
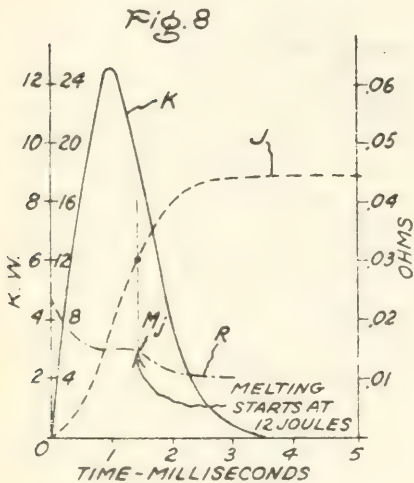
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3,488,153

NON-CATALYTICALLY PRODUCED CUBIC AND HEXAGONAL DIAMOND

Filed Dec. 1, 1966

4 Sheets-Sheet 4



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NON-CATALYTICALLY PRODUCED CUBIC AND HEXAGONAL DIAMOND

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Continuation-in-part of application Ser. No. 502,104, Oct. 22, 1965. This application Dec. 1, 1966, Ser. No. 607,107

Int. Cl. C01b 31/06

U.S. Cl. 23—209.1

17 Claims

ABSTRACT OF THE DISCLOSURE

Static high pressure methods are described for the conversion under well-defined conditions of high pressure and high temperature of:

- (a) carbon material to cubic diamond in the absence of catalyst in a solid graphite-solid cubic diamond reaction;
- (b) particular well-crystallized graphite material to hexagonal diamond in the absence of catalyst in a solid graphite-solid hexagonal diamond reaction, and
- (c) carbon material to cubic diamond in the absence of catalyst during which newly formed electrically conducting cubic diamond is melted and recrystallized as cubic diamond.

Apparatus for controllably simultaneously applying the requisite high static pressures and high temperatures for the requisite times is also disclosed.

This application is a continuation-in-part of application Ser. No. 502,104—Bundy, filed Oct. 22, 1969, which in turn is a continuation-in-part of application Ser. No. 191,972—Bunday, filed May 2, 1962 and of application Ser. No. 214,793—Bundy, filed July 30, 1962. The latter application was a continuation-in-part of application Ser. No. 191,914—Bundy, filed May 2, 1962 and all the aforementioned applications were assigned to the same assignee as the instant invention and all have been abandoned.

This invention relates to diamond and its formation or transformation from non-diamond carbonaceous material, and more particularly to the direct conversion of carbon to the hexagonal and cubic lattice forms of diamond at high pressures and temperatures in the absence of catalysts to the diamond making reaction.

The term "carbonaceous material" is used herein to describe a non-diamond material containing carbon, which, under the conditions of the reaction can react, decompose, or otherwise provide non-diamond elemental carbon prior to conversion to diamond. Elemental carbon is the *uncombined form* of carbon and includes such carbon as may be present in amorphous carbon, lamp black, coal, pitch, tar, etc. Graphite is a preferred carbon starting material because of its known and desirable characteristics, for example, its crystal structure and the relation of its crystal structure to both the cubic and hexagonal diamond crystal structures, its density, impurity content, and the relative ease of its conversion to a diamond lattice.

"Recrystallization" is the term employed generically to denote the changes which occur, when diamond becomes molten at least in part and then, re-solidifies as cubic diamond. "Molten" is indicative of gross melting conditions rather than scattered domain type of melting.

The term "conversion" is employed generically to denote the change or changes which occur in solid carbon to solid diamond conversion, particularly in graphite to diamond conversion, wherein the crystal structure of graphite is caused to change to hexagonal or cubic diamond crystal structure depending on the operating conditions, the particular crystal structure of the starting material and its orientation relative to compression forces. In the practice of this invention this is a direct change to the hexagonal or cubic diamond lattice (as the case may be) without the need of an intermediary material to facilitate the process.

Prior diamond growth techniques, both experimental and commercial have depended upon the subjection of a carbonaceous material, such as graphite, to very high pressures and temperatures in the diamond stable region of carbon on the phase diagram of carbon in the presence of or together with a specified catalyst material. After reducing the high pressure high temperature conditions, cubic diamonds are recovered. The catalyst material for the production

of cubic diamond is described as including a metal from those metals of Group VIII of the periodic table of elements chromium, manganese, and tantalum. The diamond stable region is that region generally described as being located above the graphite-to-diamond equilibrium line on the known phase diagram of carbon.

A method and an apparatus utilized to convert nondiamond carbon to cubic diamond are disclosed in U.S. Patents 2,941,248, Hall; 2,947,610, Hall et al., and 2,947,609, Strong. Briefly, the apparatus of U.S. Patent 2,941,248, Hall, includes an annular belt or die member having a convergent-divergent aperture therethrough, and a pair of oppositely positioned, concentric frustoconical punches which move into said aperture to define a reaction chamber therein. A ceramic or stone gasket of a material, such as pyrophyllite, is employed between the punches and die member for sealing purposes and over the inner surface of the die facing the reaction zone to thermally insulate this portion of the die.

One method of growing cubic diamonds, as described in 2,947,610, Hall et al., utilizes a pyrophyllite reaction vessel to contain reactant materials, for example, graphite and one of the above-mentioned metals. This vessel is placed in the described reaction chamber and motion of the punches towards each other compresses and raises pressure in the vessel. By connecting the punch members to a source of electrical power, a resistance circuit is provided through the punches and the reactant materials in the reaction vessel, for resistance heating thereof. Pressure and temperature are adjusted to provide cubic diamond reaction conditions above the graphite to diamond equilibrium line, where the catalyst metal becomes molten and exerts a catalytic action on the graphite producing cubic diamond growth therefrom. After reduction of temperatures and pressures, cubic diamond is recovered.

There are certain limitations to the foregoing method and apparatus. First, in order to convert graphite to diamond (either hexagonal or cubic) in the absence of catalyst, the apparatus must be capable of controllably exerting much higher pressures to a reaction volume. This is now made possible not only as a result of the reportioning the punches and die of the conventional "belt" apparatus described in U.S. Patent 2,941,248, Hall but also, because of actual reshaping thereof and utilization of a novel gasket configuration. Next, in the aforementioned method of cubic diamond manufacture strong limitations are placed on the presence of other materials, because of the possibility of interference with the action of the catalyst (which must be present) and consequent prevention of the formation of cubic diamond through this mechanism. With the freedom from the required presence of particular metals made possible by the method of this invention it now becomes possible to safely introduce any of a very wide selection of additive materials to the carbon material to be converted in order to produce selected different characteristics of diamond growth.

Accordingly, it is a first prime object to his invention to provide methods for the direct transformation of a carbonaceous material to cubic diamond.

It is a second prime object of this invention to provide a method for the direct transformation of particular graphitic materials to hexagonal diamond.

It is another object of this invention to incorporate in these improved methods the capacity for independent temperature and pressure control.

It is a further object of this invention to provide a method for the production of cubic and hexagonal diamond compatible with the addition of any of a very wide range of additive materials to selectively influence the physical or electrical properties of the diamond material.

It is still another object of this invention to provide static pressure methods of cubic diamond production in which the diamond-making reaction occurs in less than one-half second.

In combination with the problem of achieving and sustaining the necessary pressure in the very difficult problem, at least in the preparation of cubic diamond by the direct (non-catalytic) conversion described herein, of achieving the requisite high temperatures without melting the construction containing the carbon material being converted. Indirect heating by the use of electrical resistance heating and direct resistance heating are static methods successfully employed to raise the temperature for the preparation of hexagonal diamond, wherein the requisite temperature need not be much higher than about 1000°

C. However, when it becomes necessary to reach temperatures in the 3000° – 4000° K. range as is the case for conversion to cubic diamond at certain pressures, materials simply do not now exist capable of retaining structural integrity when statically heated to these temperatures to provide containment for the reaction. This is not to say that such materials will never be available. Static heating in the 3000° – 4000° K. range will be possible, of course, when such materials are developed. Until such time as static heating becomes feasible for achieving such high temperatures, flash heating (the discharge of electrical current through the graphite in less than one-half second) has provided the capability for creating temperatures beyond the 3000° – 4000° K. range without melting the containment for the reaction. Thus, assuming graphite to be converted to cubic diamond receives a very rapidly applied electrical discharge, the center region of the sample becomes very hot while the surrounding portion remains at a lower temperature such that even if the center region becomes molten for the short heating period, this extremely hot material is still safely contained within the surrounding graphite, thereby precluding destruction of reaction cell components.

Thus, although there does not appear to be any reason for assuming that static heating would not produce the same results as flash heating, the latter form of transient heating was employed for all experiments wherein temperatures in excess of about 2500° C. were required.

Briefly described, this invention provides static pressure methods for converting a carbon material to cubic or hexagonal diamond in the absence of a catalyst. The conversion to cubic diamond comprises the steps of:

- placing a quantity of material containing carbon in a high pressure high temperature apparatus,
- controllably subjecting said quantity of material to pressure sufficient to attain an operating pressure at least as high as the pressure of the solid diamond-solid graphite-liquid carbon triple point,
- raising the temperature of said quantity of material to simultaneously subject said quantity of material to conditions of temperature and pressure to the high temperature side of the line of threshold temperatures for the conversion of spectroscopic graphite to diamond,
- returning the converted quantity of material to ambient conditions of pressure and temperature, and
- recovering cubic diamond from said apparatus.

In the case of conversion of graphite to hexagonal diamond the following steps are carried out:

- placing in a high pressure high temperature apparatus a quantity of graphite in which the crystallite domains are relatively large and perfect and the c-axes of the crystallite domains are well-aligned in some given direction,
- said quantity of graphite being oriented in said apparatus with the direction of c-axis orientation being substantially aligned with the direction of compressive force application,
- controllably subjecting said quantity of material to pressure sufficient to attain an operating pressure at least as high as the pressure of the solid diamond-solid graphite-liquid carbon triple point,
- raising the temperature of said quantity of material to simultaneously subject said quantity of material to said operating pressure and to a setting temperature in excess of about 1000° C.,
- returning the converted quantity of material to ambient conditions of pressure and temperature, and
- recovering hexagonal diamond from said converted quantity of material.

The preparation of cubic diamond broadly described above may be practiced in one modification by employing carbon containing an impurity effective to render electrically conductive the cubic diamond material produced from the carbon under the simultaneous application of high static pressure and transient elevated temperatures induced by discharging electric current therethrough. As a result, when the raising of temperatures is effected at the proper elevated pressure, the carbon converts to electrically conducting cubic diamond and, if the quantity of energy introduced is large enough, the cubic diamond is melted. Upon reducing the temperature, while simultaneously retaining the pressure at a value above the triple point referred to hereinabove, the molten material will recrystallize in part as solid cubic diamond. In the event that the energy input is insufficient to produce melting of the cubic diamond, the

cambon is simply converted to solid cubic diamond without the subsequent melting and recrystallization.

Another aspect of the preparation of cubic diamond broadly described above encompasses the conversion of pure forms of carbon, or at least forms of carbon, which do not contain such impurities as will render electrically conductive the cubic diamond material produced from such carbon by the application of high pressures and high temperatures. With such a starting material, even by discharging electrical energy therethrough at a value somewhat in excess of the amount theoretically necessary to raise the temperature of the carbon material above the melting curve for diamond, the temperature will not be raised high enough to produce melting of the cubic diamond, because as cubic diamond is formed on the high temperature side of the line of threshold temperatures referred to hereinabove, the electrically non-conducting nature of this cubic diamond causes interruption of the path of the electrical current. Thus, the carbon is directly converted to solid cubic diamond without any melting thereof.

It has been found that, if heating is effected by applying a transient over-voltage considerably in excess of the energy required to heat pure carbon material to a temperature in the liquid carbon region at a pressure above the solid diamond, solid graphite, liquid carbon triple point, the wall material enclosing the carbon material may become so hot that it will provide a conducting path in parallel with the path for the transient electrical current provided through the carbon itself. Even though the carbon material converts to non-electrically conducting cubic diamond, if a path for the current becomes available through the wall material, it will continue to heat, become molten, diffuse into and badly contaminate the carbon material to produce a comparatively useless product. Thus, in those cases in which heating is accomplished by the discharge of electric current therethrough, although the amount of energy to be applied is not confined to narrow limits, the amount of energy should be adjusted so that the capacitor charge is almost depleted by the time the carbon material has converted to the cubic diamond form. An estimate of the amount of heat energy required is readily calculable using the data and methods disclosed herein taking into account the nature of the various materials composing the reaction vessel and its contents. Thereafter a small number of trial runs in the particular apparatus being used is sufficient to enable the skilled technician to effectively practice the several aspects of this invention.

However, one of the most interesting aspects of the broad description set forth hereinabove is the discovery that cubic diamond is only one of the forms of carbon that can be created at temperature and pressure conditions in the diamond-stable region of the phase diagram of carbon. Thus, it has been found that graphite always appears to be produced together with the cubic diamond recrystallized from the molten state in the diamond-stable region and, as well, hexagonal diamond in average crystal sizes larger than the average size of hexagonal diamonds formed in nature in meteorites upon impact thereof with the earth has been produced at temperatures and pressures in the diamond-stable region. The creation of forms of carbon other than cubic diamond in the diamond-stable region indicates with increasing clarity that the superpressure art still remains largely empirical in nature. As more such information comes to light it becomes increasingly evident that in the absence of clear and unambiguous directions as are set forth herein, operations in the diamond-stable region have proceeded with even a lesser degree of certainty than was formerly realized.

The aforementioned objects and many of the attendant advantages of this invention will be readily appreciated as the same become better understood by the following detailed description when considered in connection with the accompanying drawings in which like reference numerals designate like parts throughout the figures thereof and wherein:

FIG. 1 is an elevational view of a modified belt apparatus as employed to practice this invention;

FIG. 2 is a cross-section view of the reaction vessel insertible in the apparatus of FIG. 1 with a specimen contained therein;

FIG. 2a is a mass of cubic or hexagonal diamond recovered from the reaction vessel of FIG. 2 after the practice of this invention;

FIG. 3 is a plan view partly cut away of the reaction vessel of FIG. 2 illustrating the graphite electrodes, sample, and reaction vessel parts in operative relationship;

FIG. 4 is an illustration in cross-section of a modified form of a reaction vessel before any diamond forming process has been conducted;

FIG. 4a indicates the changes produced in the reaction vessel of FIG. 4 after the practice of this invention without melting and recrystallization of diamond;

FIG. 4b indicates the changes produced in the reaction vessel of FIG. 4 after the practice of this invention employing diamond melting and recrystallization;

FIG. 5 is a schematic representation of the electrical circuit utilized for the discharge of energy into the apparatus of FIG. 1;

FIG. 6 is a series of curves illustrating kilowatt input, joule input, and electrical resistance of a graphite sample over a period of time in a specific working example as the graphite is converted to cubic diamond;

FIG. 7 is a graph illustrating the phase diagram of carbon with the newly discovered threshold curve for the direct transition of solid graphite to solid cubic diamond;

FIG. 8 indicates the location of the melting point of carbon on a resistance curve for a graphite example and, as well, curves for the kilowatt and joule input to effect melting at a pressure just below the triple point (T_2) in FIG. 7;

FIG. 9 is a combined plot of the graphs of FIGS. 6 and 8 with respect to the resistance curves R_6 and R_8 of FIGS. 6 and 8, respectively;

FIG. 10 displays a series of resistance curves to provide a comparison of graphite melting, solid graphite direct conversion to solid cubic diamond and cubic diamond formation, melting and then recrystallization as cubic diamond; and

FIG. 11 graphically presents the change in electrical resistance resulting in a sample of annealed pyrolytic graphite during the application of high pressure and high temperature thereto, the pyrolytic graphite being disposed in the pressure apparatus with the c-axis orientation thereof extending in the direction of compression of the sample.

Referring now to FIG. 1, apparatus 10, which is a modified form of the belt apparatus disclosed in U.S. Patent 2,941,248, Hall, includes an annular convergent-divergent die member 11 having the converging-diverging aperture 12 therethrough and surrounded by a plurality of hard steel binding rings (not shown) for support purposes. One satisfactory material for die member 11 is Carboloy cemented carbide grade 55A. Modification of the die member 11 in this invention includes tapered surfaces 13 having an angle of about 52.2° with the horizontal, and the provision of a generally right circular cylindrical chamber 14 of 0.200 inch diameter.

A pair of tapered, or frustoconical, punches 15 and 16 of about 1.0 inch O.D. at their bases are oppositely positioned with respect to each other and concentric with aperture 12 and to define a reaction chamber therewith. These punches also utilize a plurality of hard steel binding rings (not shown), for support purposes. One satisfactory material for punches 15 and 16 is Carboloy cemented carbide grade 883. Modification of the punches includes tapering of flank surfaces 17, of a 60° included angle to provide faces 18 of 0.150 inch diameter, and with the tapered portions of the punches being about 0.560 inch in the axial dimension. The combination of the 60° included angle and the 52.2° angle of the tapered surfaces provide a conical annular gasket opening of wedge-shaped cross-section therebetween.

A further modification in this invention relates to sealing means. Sealing, or gasketing, is provided by means of the one-piece gaskets 19 of pyrophyllite. Conical annular gaskets 19 between the punches 15 and 16 and die member 11 are of wedge-shaped cross-section to fit the defined space and are of sufficient thickness to establish a distance of 0.060 inch between punch faces 18.

The essential modifications incorporated in the apparatus of this invention, which provide this apparatus with a capability of reaching very high pressures in the range of 100 to 180 kilobars and above, relate to ratios of certain given dimensions. These dimensions are, (1) the diameter of the punch face portion 18, (2) the distance between the punch face portions 18 in the initial position as illustrated in FIG. 1, before compression, and (3) the slant height of the gasket 19 along the flank or tapered portion 17 of the punches. In operative

working examples of the apparatus of this invention, the ratio of the gap G (distance between punch faces 18) to the diameter D of the face portion 18, is less than about 1.0, preferably about 0.50. The slant length L of gasket 19 as predicated upon the diameter of the face portion 18 is 6 times D ($L/D=6$). These values are compared to those of U.S. Patent 2,941,248—Hall, which are generally $G/D=2.0$ and L/D is less than about 1. These preferred ratios provide a greater amount of lateral support for the punches 15 and 16 without extensively increasing the required component of applied force necessary to compress the gasket for pressure rise in the reaction vessel.

A reaction vessel 20 is positioned between the punch faces 18. In this instance reaction vessel 20 includes a cylindrical or spool shaped pyrophyllite sample holder 21 having a central aperture 22 therethrough. The parts to be positioned in aperture 22 in their operative relationship are more clearly illustrated in FIG. 2 without sample holder 21. Reaction vessel 20 includes both the sample material and its heating means, in the form of a solid right circular cylinder comprising three coaxially stacked disc assemblies 23, 24, and 25. Disc assembly 23 includes a larger ($\frac{3}{4}$) segmental portion 26 of pyrophyllite, and a smaller ($\frac{1}{4}$) segmental portion 27 of graphite for effecting electrical conduction through vessel 20. Disc assembly 25 also includes a like larger ($\frac{3}{4}$) segmental portion 28 of pyrophyllite, and a like smaller ($\frac{1}{4}$) segmental portion 29 of graphite for the same purpose. Disc assembly 24 includes a pair of spaced apart segmental portions, of which only portion 30 is shown in FIG. 2, of pyrophyllite with a bar-shaped graphite sample 32 therebetween. Graphite sample 32 is about 0.020 inch thick by 0.025 inch width by 0.080 inch length. FIG. 3 illustrates the reaction vessel of FIG. 2 in a cutaway plan view for more specific indication of the operative relationship. Both segmental portions 30 and 31 are shown therein. From either FIG. 2 or FIG. 3, it can be seen that an electrical circuit is established from graphite segment electrode 27 through sample 32 to graphite segment electrode 29 for electrical resistance heating of the sample 32.

FIG. 4 illustrates modification of reaction vessel 20. In FIG. 4, reaction vessel 33 includes a pair of graphite discs 34 and 35 of about 0.010 inch thickness, which act as graphite electrodes for electrical resistance heating. An intermediate pyrophyllite cylinder 36 has a centrally-located aperture 37 therethrough which is adapted to contain sample 38. Sample 38 in one form is a graphite cylinder of 0.030 inch diameter and 0.040 inch length.

Apparatus 10 as described provides desired pressures in the region above the graphite-to-diamond equilibrium line E on the phase diagram of carbon as illustrated in FIG. 7. Operation of apparatus 10 includes placing the apparatus as illustrated between the platens of a suitable press and causing punches 15 and 16 to move towards each other thus compressing the reaction vessel and subjecting sample 32 (38) to high pressures. To calibrate the apparatus for high pressures, the calibration technique as given in aforementioned U.S. Patents 2,941,248 and 2,947,610 may be employed. This technique includes the subjecting of certain metals to certain pressures with the apparatus knowing that at the points at which an electrical phase transition for each of these materials occurs, pressures of known magnitude are indicated. For example, during the compression of iron a definite reversible electrical resistance change will be noted, when a pressure of about 130 kilobars is applied. By the same token then, an electrical resistance change in iron denotes the application of 130 kilobars pressure by the apparatus.

The following table is indicative of the metals employed in the calibration of the belt apparatus as described:

TABLE I

Metal:	Transition pressure kilobars
Bismuth I ¹ -----	25
Thallium -----	37
Cesium -----	42
Barium I ¹ -----	59
Bismuth III ¹ -----	89
Iron -----	130
Barium II -----	141
Lead -----	161
Rubidium -----	193

¹ Since some metals indicate several transitions with increasing pressure, the Roman numerals indicate the transition utilized, in sequential order.

A more particular description of methods employed to determine the above transition values may be found in publications of Calibration Techniques in Ultra High Pressures, F. P. Bundy, *Journal of Engineering for Industry*, May 1961; Transactions of the ASME, Series B, and P. W. Bridgman, *Proceedings of the American Academy of Arts and Science*, vol. 74, p. 425, 1942, vol. 76, p. 1, 1945, and vol. 76, p. 55, 1948. The Bridgman values were later corrected to their present values as given in the above Table, R. A. Fitch, T. F. Slykhouse, H. G. Drickamer, *Journal of Optical Society of America*, vol. 47, No. 11, pp. 1015-1017, November 1957, and A. S. Balchan and H. G. Drickamer, *Review of Scientific Instruments*, vol. 32, No. 3, pp. 308-313, March 1961. By utilizing the phenomenon of electrical resistance changes of the metals at the pressures given, a press is suitably calibrated to provide a reading for the approximate pressure reached within the reaction vessel.

The graphite sample 32 (38) may be subjected to very high temperatures, where desirable or necessary, by transient electrical resistance heating by the rapid discharge of current therethrough. By connecting a source of power (not shown) to each punch 15 and 16 with electrodes 39 and 40 current may be discharged, for example, through punch 15 to graphite electrode 27, through sample 32 and graphite electrode 29 to punch 16.

One arrangement for a circuit employed for discharging current through sample 32 or 38 is best described with respect to FIG. 5. Generally speaking, the circuit 41 is a capacitor discharging circuit, which discharges current through apparatus 10, as has been described. During the discharge the oscilloscope tracing is photographed. Later, the photograph is analyzed for the values of the voltage and current applied from which the resistance and power conditions during the discharge are derived. These values are then coordinated with values accumulated by direct reading before and after the discharge. In FIG. 5, circuit 41 includes a bank 42 of electrolytic capacitors having a capacity of about 85,000 microfarads. Capacitor bank 42 is capable of being charged up to about 120 volts. Lead 43 connects one side of capacitor bank 42 to upper punch 15, through switch 44 and a nonconductive current resistor 45 of 0.00193 ohm. Resistor 45 includes ground connection 46a. The other side of capacitor bank 42 is connected by means of lead 47 to punch 16 through an inductance choke coil 48 of 25 microhenries and 0.0058 ohm resistance. Capacitor bank 42 is charged from a suitable source of power 49 (not illustrated). It can thus be understood that, after charging capacitor bank 42, switch 44 may be closed to discharge current through sample 32 in reaction vessel 20.

If the temperatures to be employed are less than about 2500° C., indirect heating with a resistance heater sleeve of a stable material, such as platinum, tantalum, Invar, etc. surrounding and spaced and insulated from the reaction zone may be used or direct static electrical resistance heating can be employed using the structures shown in FIGS. 2 and 4.

Thermal flow calculations with respect to cold graphite surrounded by such materials as pyrophyllite, magnesium oxide (MgO) and boron nitride (BN), and based on ordinary values of thermal conductivity and heat capacity, indicate that the period of time for the temperature at the center of a graphite sample in the reaction vessel of FIG. 2 to cool off by a factor of one-half is about 0.015 second. The described electrical circuit is designed to provide injection of the required heating energy in about 0.001 to 0.004 second, which is considerably more rapid than the aforementioned cool off period.

The most expedient manner of observing the behavior of an electrically conductive sample is by means of electrical resistance measuring. As is well known, graphite is considered to be an electrical conductor while cubic diamond is considered an electrical insulator. In this invention where graphite sample 32 is a connecting link of the circuit as described, the transformation or conversion of graphite to diamond (cubic or hexagonal) will be indicated by an increase in resistance and/or the reaching of open circuit conditions in the case of cubic diamond. In the practice of this invention, therefore, a Kelvin bridge resistance meter 50 is connected to top punch 15 and bottom punch 16 to measure the resistance through the reaction vessel or sample 32.

For a graphic indication of the voltage and current passed through sample 32, circuit 41 includes a Tektronix 535A oscilloscope 51 connected to punch 16 by lead 52 to detect the voltage signal, and connected by lead 53 to lead 43 between switch 44 and resistor 45 to detect the current signal. Oscilloscope 51 includes a ground connection 46b as illustrated. The ground 46a of circuit 41 is located between sample 32 and the current resistor 45 so that the voltage

and current signals to the oscilloscope 51 have a common ground. Oscilloscope 51 provides a recording interval that corresponds to the capacitor bank discharge time with 0.5 and 0-10 milliseconds having been employed for the examples of this invention. The oscillogram was photographed with a Land Polaroid camera mounted in front of the screen.

Various arrangements may be utilized to provide a triggering signal for oscilloscope 51. One convenient circuit utilizes a capacitor 54 of 1 microfarad capacity connected by lead 55 from one side of induction choke coil 48 to oscilloscope 51. An additional capacitor 54' of 1 microfarad capacity is connected from the other side of inductance choke coil 48 to ground 46c. The sweep triggering signal is thus about the value of the voltage drop across inductance choke coil 48. It is understood that many variations of this circuit are also applicable for the intended purpose. For example, more oscilloscopes may be employed or the oscilloscope and its circuitry may be dispensed with, when measurements are unnecessary.

Temperature rise in the sample in the case of transient heating is determined by calculation, since there are no known instruments which will record temperatures of such high values in such short periods of time with a satisfactory degree of accuracy. Temperature calculations are based in part on the known values of the specific heat of graphite over a wide range of temperatures. Such values have been experimentally determined compared with prior art values. For example, see L. M. Currie, V. C. Hamister, H. G. McPherson, "The Production and Properties of Graphite for Reactors," a paper presented at the United Nations International Conference on The Peaceful Uses of Atomic Energy, Geneva, Switzerland, August 8-20, 1955, published by National Carbon Co. Also J. E. Hove "Some Physical Properties of Graphite as Affected by High Temperature and Irradiation," Industrial Carbon and Graphite, Society of Chemical Industries, London, 1958. The correlated values from the above references were employed in the temperature calculation of this invention and are given in the following table:

Table 2

T (° K.) :	Cp. (Cal./mole ° K.)
300	2.05
500	3.49
750	4.48
1000	5.14
1250	5.35
1500	5.75
2000	6.0
2500	6.2
3000	6.35
3500	6.5
4000	6.65

When the above values are plotted in curve form with Cp (Cal./mole ° K.) as the ordinate and T(° K.) as the abscissa, the area under the curve may be integrated and plotted to provide a further curve indicating Q (K cal./mole) versus T° K., or the temperature versus molar energy insertion for graphite. By the same token, substitution of the above table of values in the equation

$$Q = \int_{T_0}^T Cp(T) dT$$

provides the same result. Q is heat input in Kcal./mole. T₀ is initial temperature, T is final temperature and Cp is specific heat.

The following Table 3 provides exemplary values of Q and T₀:

TABLE 3

Q (Kilocalories/mole) :	T K.
0	300
5	1450
10	2250
15	3050
20	3800
25	4600

From the oscillograph reading of voltage and current, the product of EI (or voltage times current) provides an indication of power or wattage input at any instant of time. Thus, curve K (FIG. 6) is provided indicating kilowatt input to the sample as a function of time.

The relationship of voltage divided by current equals resistance or, $R=E/I$. The E and I values are taken from the oscillogram and the E/I value provides a resistance curve, which is illustrated in FIG. 6 as curve R .

The product of kilowatts multiplied by the time in milliseconds, which is the integral of the area under the kilowatt curve, equals the joule energy input to the sample, illustrated in FIG. 6 as curve J .

In calculating the temperature reached in the sample, corrections must be made with respect to certain losses. The nature of the losses and the manner of correcting therefor are as follows: (1) the loss of heat generated in the end electrode regions for example between input at one of the electrodes (27 or 29) and the sample 32; since the materials and changes in cross section are known, this heat loss may be calculated; (2) thermal conduction losses to the walls of the reaction vessel; by performing operations in reaction vessels having different wall materials and measuring the cool-off time, the heat loss, as based upon the known graphite melting temperature, is determined for a given reaction vessel configurations; and (3) electrical leakage loss in the walls, which become more conductive at high temperatures; by performing several operations in reaction vessels having different wall materials, a comparison may be made of the results to determine this loss. Accordingly, because of these more important corrective factors, temperature values may vary as much as $\pm 10\%$. The desired temperature in the sample may be attained by varying the electrical charge or capacity of circuit 41. At the same time, however, the final temperature reached in the graphite sample 32 (or 38) is not only predicated upon the electrical energy introduced therein, but also on its particular configurations.

The operative conditions or region of operation with respect to pressures and temperatures of the reaction of this invention are best described with relation to FIG. 7. In FIG. 7, there is illustrated a phase diagram of carbon with the ordinate indicating a scale of pressures in kilobars and the abscissa indicating temperatures in degrees Kelvin. The "bar" unit of pressure measurement is utilized in this specification as a measure of pressure conditions and is more acceptable in the high pressure art by being an absolute unit. The kilobar is 10^9 dynes/cm.², and is equivalent to 1020 kg./cm.² or 987 atmospheres.

The previously known graphite-to-diamond equilibrium line between the graphite stable region G and a portion of the diamond stable region D_1 is indicated as E . Region G is defined as a graphite stable region and a diamond metastable region indicating that graphite and diamond both exist in this region but that diamond is thermo-dynamically unstable therein. Region D_1 (with line M defining its upper limits) is denoted as a diamond stable and graphite metastable region, since both forms of carbon exist in this region but graphite is thermodynamically unstable therein. As is disclosed herein, the hexagonal form of diamond can also exist in regions D_1 and G , but absolute data as to the thermodynamic stability of hexagonal diamond are not yet available. The portion of line E up to about 1200° Kelvin and 50 kilobars, represents that portion of the graphite to cubic diamond equilibrium line originally calculated by thermodynamic calculations based on experimental values of the physical properties of diamond and graphite. See F. D. Rossini and R. S. Jessup, Research Journal National Bureau of Standards, vol. 21, p. 491, 1938. The remaining portion of line E of the graphite to cubic diamond equilibrium line has been extrapolated by R. Berman and F. Simon, Zeit. Elektrochem., vol. 59, p. 333 (1955). By experimental evidence in conjunction with growing cubic diamonds, the extrapolation has been substantially verified so that the line E exists approximately as indicated in Fig. 7 up to about 120 kilobars. See Diamond-Graphite Equilibrium Line from Growth and Graphitization of Diamond, Journal of Chemical Physics, vol. 35, No. 2, pp. 383-391, 1961. It should be obvious to those skilled in the art that variances in the position of the equilibrium line E do not adversely affect the teachings of this invention since the essential requirements are operating conditions above this line, wherever this line is positioned and/or in the cubic diamond stable region of carbon obtained by any calibration technique of a particular apparatus.

An important line on this diagram is the melting line of graphite, which line commences, as is known in the art, at the triple point T_1 located at about 0.12

kilobars and 4050° K. Point T_1 is known as the triple point for carbon (graphite) as a solid, liquid, and vapor. This point was experimentally determined by J. Basset, *Journal of Physics Radium*, vol. 10, 1939, and T. Noda reported by II. Mu. Proc., International Symposium on High Temperature Technology, Asilomar Conference Grounds, Calif., Oct. 6-9, 1959; Stanford Research Institute, Menlo Park, Calif., published by McGraw-Hill Book Co., Inc., New York. Point T_1 indicates that point where carbon may exist simultaneously in the graphite solid, liquid, and vapor state, and defines together with lines V_1 , S_1 and V_s (not shown), the solid (graphite) region G, liquid region L, and vapor region V , of carbon. The line V_s is not shown but rises from 3860° K. at room temperature, to T_1 . The V region is exaggerated so that it may be illustrated in the drawing.

It was discovered that line S, which was formerly considered to be the trace of the boundary line between solid and liquid carbon, is not an accurate presentation thereof. As has been newly discovered, the solid-liquid carbon boundary takes the form of line S_1 as illustrated. Line S_1 commences with a positive slope upwardly from point T_1 and changes to a negative slope to approach point T_2 . The discovery of the curve characteristic of line S_1 was a result of a series of operative examples of melting graphite at different pressures and noting the melting temperature. The process of melting graphite is described as follows:

The electrical resistance characteristics of most graphites are such that the resistance decreases with increasing temperature. However, upon melting at high pressure, the resistance of graphite decreases with a sharp break in the resistance curve. The result of many melting experiments with graphite reveals that the melting temperature conditions agree favorably with values reported in the art, Basset and Noda above-mentioned. An examination of many graphite samples both before and after each melting experiment indicates the melting of the graphite quite clearly. Before melting, the cross section of a graphite rod or bar appears as a coarse, irregular, or random grain structure. After melting and cooling, a cross section of a similar graphite rod or bar indicates a structure of dendritic graphite needles radially oriented and extending from the colder portion of the periphery towards the center. Additionally, X-ray diffraction patterns of ordinary graphite were compared to X-ray diffraction patterns of a sample of recrystallized molten graphite at locations in a sample where the graphite did and did not melt. These patterns were similar for the ordinary graphite and the portions of a sample that did not melt. However, the diffraction lines of the melted portions are substantially sharper showing that the recrystallized graphite has much larger and more regularly oriented crystallites than the unmodified or unmelted portion. The appearance is quite similar to a cross section of a quenched metal (chilled casting).

The following Table 4 illustrates several examples of graphite melting. In each instance examination of the graphite sample clearly evidenced melting as described. Em is the term denoting the energy input, Kcal./mole, per unit weight of sample required to bring the sample to its melting point. In these examples, the graphite employed was graphite of spectroscopic purity. Table 4 is exemplary, as various other graphites as hereinafter described were also melted. The reaction vessel wall materials are varied for further corroboration of the results. Reaction vessel materials as well as gasket materials may include for example pyrophyllite (Py), catlinite, talc, magnesium oxide, alumina, thoria, and other similar stones and ceramics, for all operations including the diamond reaction. Wall materials relate to disc segments 26, 28, 30 and 31 to FIG. 2 and cylinder 36 of FIG. 4. It has been found that within the calibration range of the apparatus, the various wall materials do not appreciably affect the pressure employed. Temperature rise in case of transient heating will cause the pressure in the reaction vessel to rise. Such a pressure rise is estimated to be in the rang of 10-20 kilobarse but may exceed this range.

Operative practices in these examples are similar to the general operation of the apparatus as previously described. The reaction vessel as illustrated in FIGS. 2 or 4, and placing the vessel in position in apparatus 10 of FIG. 1. By means of a press apparatus (not illustrated), punches 15 and 16 are caused to move together to raise the pressure in the reaction vessel to the given value. Thereafter, circuit 41 is caused to discharge electrical energy through the sample to provide the requisite heating. The pressures indicated are comparable and are considered equivalent in the range of calibration of the apparatus.

TABLE 4

	Reaction vessel	Wall matl.	Pressure, kilobars	Electrical Energy		Em Kca./mole
				Volts	Farads	
Example No.:						
1	Figure 4	Py	117	30	0.040	24 not melted.
2	do.	Py	121	32	.040	26 not melted.
3	do.	Py	118	40	.040	28 melted.
4	do.	Al ₂ O ₃	119	40	.040	Do.
5	Figure 2	BN	115	25	.085	29 melted.
6		BN	97	110	.080	31.5 melted.
7		BN	77	110	.080	33 melted.
8		BN	66	110	.080	36 melted.
9		BN	60	110	.080	35 melted.
10		BN	47	110	.080	33.5 melted.

Examples 6-10 of Table 4 were performed at lower pressures and the belt apparatus and reaction vessel were of the type set forth in aforementioned U.S. Patents 2,941,248, Hall and 2,947,610 Hall et al. The sample was a graphite rod 0.040 inch diameter and 0.280 inch length surrounded by a boron nitride sleeve. Many melting examples in addition to those listed above and conducted both at lower and at higher pressures have been carried out to determine the position and shape of melting point line S_1 on FIG. 7. It was noted in the course of the examples of melting graphite that an area enclosed by curve S_1 and bounded by line S is a graphite zone G_1 . In some melting examples small cubic diamond seeds were embedded in the graphite sample. It was found that the cubic diamond crystals always graphitized before the melting point of graphite was reached, and that the threshold temperature of the graphitization was very sharp with graphitization complete. The graphitization occurred about 300° to 400° lower in temperature than melting line S_1 .

Line M (FIG. 7), an extension of line S_1 , is the instantaneous metastable graphite melting line and indicates the lower border of region D_2 . Above line M , carbon must exist as some form of diamond. The points 56, 57, 58, 59 and 60 have been determined from pressure/volume data presented in "Behavior of Strongly Shocker Carbon" by B. J. Alder and R. H. Christian (Physical Review Letters, 7, 367, [1961]); point 61 has been calculated from information reported in "Formation of Diamond by Explosive Shock" by P. S. DeCarli and J. C. Jamieson (Science 133, 1821, [1961]). The locations of points 60 and 61 obtained by shock compression conversion of carbon corroborate the location of line M .

An exemplary illustration of a melting point M_j of graphite is illustrated in FIG. 8, which shows the K , J , and R curves for Example 3 (Table 4). The melting point M_j is clearly evidenced by a sharp drop in the resistance curve as illustrated. This M_j point compares favorably to the M_j point of the remaining samples. The calculated temperature of melting as extrapolated to atmospheric conditions also compares favorably with prior art knowledge of the melting point of graphite at about 4050° K.

In attempting to perform the melting examples at higher pressures, it was unexpectedly discovered that graphite converted to either hexagonal or cubic diamond at temperatures less than those at point T_2 and before any melting of the graphite occurred. Moreover, the conversion furthermore took place without the presence of any catalyst material as previously considered necessary.

The unexpected nature of this discovery is indicated by the fact that one of the discoverers of the catalytic conversion of non-diamond carbon to cubic diamond considered the possibility of direct conversion (i.e. without the benefit of catalyst, solvent or similar mechanism) of graphite to cubic diamond at high pressure and high temperature and concluded that cubic diamond cannot be formed directly from graphite (H. T. Hall, Proceedings of the Symposium on High Temperature "A Tool for the future." June 25, 26, 27, 1956. pp. 164-165).

CONVERSION TO CUBIC DIAMOND WITHOUT MELTING IN THE ABSENCE OF CATALYST

Exemplary of the practice of converting graphite to cubic diamond by this invention, reaction vessel 33 was assembled with a 0.65 mg. spectroscopic graphite sample as illustrated and described with respect to FIG. 4 and was placed in the belt apparatus as in FIG. 1. Apparatus 10 was then positioned

between a pair of platens in a hydraulic press to compress reaction vessel 33 to raise the pressure in graphite sample 38 to about 130 kilobars in the region of the iron transition by press calibration. Pressure rise to the iron transition region may be accomplished slowly or rapidly with no change in the final result, and may also be incremental or constant. In this exemplary practice, pressure rise was completed in about 3 minutes.

After pressure rise was completed and after circuit 41 had been charged, switch 44 closed for a discharge of 0.085 farad at approximately 18 volts through the apparatus and sample. After the circuit discharge, an examination of resistance readings on the Kelvin bridge resistance meter 50 showed a rise in resistance or open circuit condition indicating that graphite sample 38 had converted or changed from its electrically conducting characteristics as graphite, to its nonconducting characteristics as cubic diamond.

In the above example, as well as in the hereinafter tabulated cubic diamond producing examples, a series of curves (K, J and R) was drawn as illustrated in FIG. 6. The K curve indicates the kilowatt input to the graphite sample. The J curve illustrates the energy input in joules and the R curve illustrates a continuous reading in ohms. As previously described, integration of the area under the kilowatt curve with respect to time will provide the joule input curve from which the temperature in the sample may be calculated within the limitations as described. Upon the discharge of electrical energy (transient heating) through sample 38, the resistance of sample 38 decreases until a point is reached, at about 1.5 milliseconds on the R curve, where the resistance begins to rise. At this point conversion of graphite to cubic diamond is taking place. Depending on the degree and amount of conversion, curve R may rise to infinity indicating open circuit conditions or show a lower rise to illustrate partial conversion, i.e., a portion of the graphite converts.

After removal of reaction vessel 33 from apparatus 10, it was noted upon examining sample 38 that the sample retained the cylindrical configuration of the original sample but had experienced a small reduction in height (see FIGS. 4a and 4b). Measurement of the height reduction indicates that it corresponds to the decrease that would reflect the change in density from graphite to diamond. They cylindrical form 38a was a polycrystalline disc located in the center portion of the height of the original sample and contained a great number of very small diamond crystallites of a dark color and about 1 micron in longest dimension. Unconverted pure graphite remaining of the original sample rod is shown at the ends thereof. The verification of cubic diamond included cleaning the sample in a heated mixture of concentrated sulphuric acid, (H_2SO_4) and potassium nitrate (KNO_3) and subjecting the sample to scratch tests, buoyancy tests and X-ray analysis, all of which conclusively indicated diamond. The X-ray analysis of a number of these recovered samples both before and after cleaning showed that the entire mass was cubic diamond and essentially all graphite therein had been converted to cubic diamond.

Molten graphite is not only electrically conductive but also has less electrical resistance than solid graphite. In the conversion of graphite to cubic diamond by this invention, the resistance curve R breaks sharply upward to infinity or open circuit condition. This upward curve (sharp increase in resistance) takes place before any sharp downward occurs. In fact, the conversion to cubic diamond provides open circuit conditions and if temperature conditions were such as to carry temperatures beyond the point at which the cubic diamond would become molten carbon such a condition would have to be manifest as a change with the resistance curve turning downwardly. However, no gross melting occurs because no drop in the resistance curve is noted. This is clearly illustrated by comparison of the resistance curve R of FIG. 6 with the resistance curve R of FIG. 8. Graphite conversion to cubic diamond starts at 7.5 joules (FIG. 6), while graphite melting starts at 12 joules, FIG. 8. These resistance curves were obtained by identical samples with only pressure and electrical energy input changed. In the examples of FIG. 6 and FIG. 8, the pressures were 130 and 118 kilobars, respectively. In the run graphically represented in FIG. 8, the graphite would have been converted to cubic diamond had the pressure been at 130 kilobars. The practice of this aspect of the invention below the melting point of graphite is established by comparison of these two exemplary resistance curves as more clearly illustrated in FIG. 9.

In FIG. 9, R_6 denotes the resistance curve R of FIG. 6 and R_8 denotes the curve R of FIG. 8. These curves are plotted with respect to the joule input to

the sample. It is noted that cubic diamond formation commences in the R₆ example at about 7.5 joules input with the curve rising sharply upwards. Cubic diamond was recovered from this sample. The R₈ curve illustrates melting of the graphite starting at about 12 joules. Examination of this sample indicated evidence of melting as described previously. An important feature to note is that about 4.5 joules input separates the onset of the conversion to cubic diamond and the start of the graphite melting process.

When transient heating is employed in the practice of this invention, a predetermined amount of electrical energy is inserted in a predetermined graphite sample and cubic diamond is recovered. Ordinarily, more energy is inserted than that just necessary to pass the threshold temperature (i.e. the temperature at a given pressure at which the onset of conversion of graphite to cubic diamond occurs), to secure more complete conversion, and to ascertain entry into the conversion region for cubic diamond. However, unless the overvoltage is excessive so as to cause sufficient melting of the sleeve enclosing the carbon (preferably graphite) sample to established a separate path for the heating current, when pure graphite converts to cubic diamond, the discharge circuit is immediately opened, because cubic diamond is electrically non-conductive. This is a distinctive feature of this invention, and variance of energy insertion in duplicate samples indicates that the open circuit conditions occur at the same time. Thus, while the available energy may be sufficient to melt graphite, the occurrence is prevented by the conversion process and resultant open circuit conditions.

If, on the contrary, the graphites chosen for the practice of this invention contain such impurities as will result in the production of electrically conductive cubic diamond, it has been found that open circuit conditions can be avoided. Boron is one impurity which produces electrically conducting cubic diamond. Other impurity materials for producing electrically conducting cubic diamond from carbon material containing these impurities are disclosed in U.S. Patent No. 3,148,161, Wentorf, Jr. et al.

Examples illustrative of the practice of this invention wherein the conversion of non-diamond carbon to cubic diamond is effected without melting of the diamond either because of the non-electrically conducting nature of the cubic diamond material produced, or because of a limitation in the amount of electrical energy input to an impurity-containing carbon starting material are set forth in Table 5 to follow.

Operative techniques associated with these examples are similar to those previously described in the example illustrating the production of cubic diamond and in the graphite melting example. All procedures utilized in these examples are similar to those employed with respect to Table 4 examples. All wall materials are as noted. Under the heading "Reaction Vessel" size L is approximately 0.080 inch length, 0.022 inch height and 0.025 inch width, and size S is approximately 0.080 inch length, 0.018 inch height and 0.022 inch width. The sample size for the FIG. 4 examples is standardized at approximately 0.030 inch diameter and 0.040 inch height unless otherwise noted. The absence of any size notation indicates a sample size as described herein with respect to the particular reaction vessel configuration. In Table 5, Sp is spectroscopic graphite, Pg is pyrolytic graphite, B344 is boron-containing graphite, SB is Shawinigan Black, Py is pyrophyllite, Alua is alumina and MgO is magnesia.

The particular graphites employed in these examples or in the practice of other aspects of this invention are described as follows:

Spectroscopic rod or electrode graphite is a randomly oriented polycrystalline pure form of graphite, of about 1.65 grams/cm.³, produced specially as electrodes in spark spectrum devices for chemical analysis. Since it is used as are electrodes to vaporize materials, for chemical analysis by spectral emission methods, it is especially free of chemical elements, which give spectral lines in the part of the spectrum used in the analyses. This means all metals such as iron, nickel, aluminum, etc., and semi-metals such as germanium, antimony, bismuth, etc. are absent.

SP-1 graphite is a special high purity spectroscopic graphite in powder flake form with larger crystals. It is produced by the National Carbon Company and designated as SP-1.

Graphite denoted as B344 is high purity randomly oriented polycrystalline graphite which contains about 0.2-0.3% by weight of boron carbide. These

materials are mixed in powder form, compressed and fired at about 1500 to 2000° C. The density of this graphite is about 1.7 to 1.8 grams/cm.³ in solid rods or bars.

Graphite denoted as pyrolytic graphite is graphite formed by the thermal decomposition of a carbonaceous gas such as methane. It is of high purity with oriented crystal structure. This graphite when annealed at about 3000° C. for about 1 hour is termed annealed pyrolytic graphite. The annealed form is highly crystallized with the c-axes of the crystallites parallel.

Ticonderoga graphite is a natural graphite from Ticonderoga, N.Y., and is graphite mined in that locale. This graphite material contains some impurities mechanically adsorbed or interleaved between crystallites. The crystallites may be quite large. Some specimens may be single crystals.

Shawinigan black is a lamp black "amorphous" (i.e. almost non-crystalline) carbon commercially available as Shawining black from Shawinigan Chemicals Limited, Shawinigan, Quebec, Canada.

TABLE 5

	Reaction vessel	Vessel wall matl.	Sample natl. graphite	Pressure kilobars	Electrical Energy		Results
					Volts	Farads	
Example No :							
1	Figure 2	Py	Sp	130	16	1.805	Cubic diamond
2	do	MgO	Sp	130	18	0.085	Do.
3	do	MgO	Sp	130	18	.085	Do.
4	do	Py	Sp	138	33	.040	Do.
5	Figure 2, S	Py	Sp	130	16	.085	Do.
6	Figure 2, L	Py	Sp	140	20	.085	Do.
7	Figure 4	Py	Sp	130	32	.040	Do.
8	do	Alua	Sp	140	30	.040	Do.
9	do	MgO	Sp	140	30	.040	Do.
10	Figure 2	Py	Sp	140	25	.040	Do.
11	Figure 4	Py	B344	180	22	.085	Do
12	do	Py	(1)	140	31	.040	Do.
13	Figure 2	Py	B344	130	20	.085	Do.
14	do	Py	B344	130	22	.085	Do.
15	do	Py	B344	130	18	.085	Do.
16	Figure 4	Py	SB	140	26	.040	Do.
17	do	Py	SB	140	20	.040	Do.

¹ Dixon HB Pencil Lead Graphite

The examples as given in Table 5 are representative examples of a number of operations. In order to determine minimum conditions several examples were completed at successively higher pressures and temperatures to determine where conversion would and would not take place. For example, with respect to spectroscopic graphite, the conversion to cubic diamond takes place between about 120-130 kilobars as minimum pressure.

Because of the different densities of the various graphites and carbons, and then inadvertent variations in the dimensions of the specimen used in the experiments conducted in connection with this invention, the actual weight of carbon into which the electrical energy is inserted varies somewhat. Thus, what may appear to be minor discrepancies between various examples in Table 5 fall into agreement when corrections are made for density, size and stray energy losses.

To correlate the difference in sample sizes, when transient heating is produced by electrical discharge, a general minimum energy insertion per unit weight of sample is given as about 16-17 kilocalories/mole of non-diamond carbon. This energy insertion defines the point where an upward change in the resistance curve is noted. Accordingly, in practice more input energy is needed for completion. In the practice of this invention with the samples as indicated an average of about 25 kilocalories/mole of non-diamond carbon is utilized.

When the direct conversion of non-diamond carbon to cubic diamond is conducted with the reaction vessel of FIG. 4 and the electrical energy applied is in general accordance with the aforementioned guidelines for energy input, or at least the overvoltage is kept to a minimum, the converted sample has an appearance such as is shown in FIG. 4a. The centrally-located portion 38a is a pill-like formation of cubic diamond. The upper and lower ends of the former graphite sample 38 are unconverted. In the case of graphite sample 32 (sample holder 20 of FIG. 2) the converted material is, likewise, centrally-located along the length of the sample in this manner. The reason for this is that the highest temperature is attained at the center, converting this graphite first. Then, when the pill-like mass of cubic diamond material is formed, the resistance of the circuit quickly rises until short-circuit conditions are approached or reached and in sufficient additional heat can be put into the sample to convert the graphite at the far ends thereof.

Preparation of cubic diamond at various pressure-temperature combinations and using various randomly oriented graphites indicates that the threshold temperature is primarily pressure-dependent as is shown on FIG. 7, wherein line Th is the typical threshold curve for randomly oriented graphites such as spectroscopic graphite and B344 graphite. The method employed to determine curve Th is essentially that of the examples of Table 5 in determining minimum pressures. At a given pressure different electrical energy discharge energies are employed to determine where the conversion does and does not take place and thus a threshold temperature based upon rapid electrical energy input to the sample is obtained. The thickness (horizontal dimension) of area A is dependent on the time of reaction. For example, in the practice of this invention, the reaction may proceed relatively slowly (on the order of 3-5 milliseconds) with the reaction commencing several hundred degrees ($^{\circ}$ C.) to the left of line M. Where the reaction proceeds more rapidly (in microseconds) the commencement of the reaction is closer to line M and the thickness of area A diminishes. Conversion of graphite to diamond commences in area A and is completed, when line M is reached. Only diamond exists between lines M and S₂.

CONVERSION TO CUBIC DIAMOND WITH MELTING AND RECRYSTALLIZATION IN THE ABSENCE OF CATALYST

As was earlier stated, when a graphite material, which converts to electrically conductive cubic diamond, is subjected to high pressures and high temperatures induced by electrical discharge in the manner described hereinabove, the resistance curve rises, but it does not reach open circuit conditions and as a result substantially more electrical energy than is necessary to effect conversion of the graphite to cubic diamond may be inserted into the sample. When these greater amounts (relative to the energy for solid-to-solid conversion) of energy are introduced into such impurity-containing carbon, it is possible to carry the temperature conditions well into liquid region L (FIG. 7) and this is possible, (a) because the graphite is converted to electrically conductive diamond, (b) the heating continues and (c) the cubic diamond formed as the result of solid-to-solid conversion thereafter is melted. The melting of the cubic diamond becomes manifest as an abrupt drop in resistance. Line S₂ in FIG. 7 designates the diamond melting line. Line S₂ rises upwardly from point T₂ curving through previously established points 56, 57 and 58 determined by conversion from pressure volume points (see B. J. Alder and R. H. Christian, *Physical Review Letters*, vol. 7, p. 367 1961). Thus, if the heating energy input is sufficient to cause the temperature to cross the threshold curve (Th), whereby impurity-containing graphite is converted to electrically-conducting cubic diamond, and is also high enough to melt the electrically conductive cubic diamond so formed reaching a value of temperature to the right of line S₂ and thereby in the liquid carbon region L, a mixture of recrystallized cubic

diamond and graphite is obtained by maintaining the pressure above triple point T_2 and reducing the temperature to reestablish conditions in the diamond stable region to the left of line S_2 in region D. The reason for the creation of any graphite at all during recrystallization from the molten state in the diamond-stable region lacks any rational explanation at the present time.

As an illustration of the manner in which cubic diamond may be produced by recrystallization from the molten state, B344 graphite was employed as a sample. Such a graphite sample and similar graphite discs 34 and 35 were utilized in the reaction vessel of FIG. 4 and placed in the belt apparatus 10 of FIG. 1. Part 36 was thoria, ThO_2 . Apparatus 10 was then positioned between a pair of platens in a hydraulic press to compress reaction vessel 33 to raise the pressure in graphite sample 38 to about 140 kilobars, which is a pressure above the region of the iron transition by press calibration. Pressure rise may be accomplished slowly or rapidly with no change in the final result, and may also be incremental or constant. In this exemplary practice, pressure rise was completed in about 3 minutes.

TABLE 6

Example No.:	Sample Graphite	Wail matl.	Pressure, kilobars	Energy Insertion		Results
				Volts	Farads	
1.....	B344	Py	130	22	.085	Solid black cubic diamond near ends. The center material (from melt) was mostly cubic diamond.
2.....	B344	MgO	149+	25	.085	Similar to No. 1.
3.....	SB	Py	140	26	.040	White cubic diamond around walls; mixture of cubic diamond and graphite in central molten zone.
4.....	SB	Py	140	20	.040	Do.
5.....	SB	ThO_2	150	18	.085	Do.
6.....	B344	ThO_2	150	20	.085	Do.
7.....	B344	ThO_2	150—	25	.085	White cubic diamond around walls; mixture of cubic diamond and graphite in central molten zone. Black cubic diamond formed clear to punch faces.
8.....	B344	ThO_2	145	26	.085	Do.
9.....	B344	Py	180	22	.085	The resulting sample was composed of a thick white cubic diamond cylindrical covering or shell having a small ellipsoidal center section which was black and contained both graphite and cubic diamond recrystallized from molten carbon.
10.....	B344	ThO_2	180	24	.085	This example is a repeat of Example 9 for the pressure involved but with a greater energy insertion. The resulting sample was composed of a thin cylindrical shell or coating of grey white cubic diamond with a large ellipsoidal center section of almost 2 times the volume of the center section of Example 2. This center section contained both graphite and cubic diamond recrystallized from the melt. The size of the center section indicates that melting in Example 10 was far more extensive than melting in Example 9.

After pressure rise was completed and after circuit 41 has been charged, switch 44 was closed for a charge of .085 farad at approximately 26 volts through the sample. After the circuit discharge, calculations of the voltage and current curves to provide resistance show a rise in resistance indicating conversion to cubic diamond, as is the usual case, but then a marked decrease in

resistance indicating melting of the cubic diamond and a final rise in resistance indicating recrystallization of graphite to cubic diamond upon cooling at the elevated pressure.

After removal of reaction vessel 33 from apparatus 10, and examining sample 38, it was noted that sample 38 retained its cylindrical configuration and was composed of a great number of very small cubic diamond crystallites mixed with graphite. It was noted that the sample included a shell or coating of greyish white cubic diamond crystals about a dark core. X-ray examination indicated cubic diamond in the core as well as in the shell. Verification of cubic diamond also included cleaning the sample in a heated mixture of concentrated sulphuric acid (H_2SO_4) and potassium nitrate (KNO_3), and subjecting the sample to scratch tests and buoyancy tests.

A certain amount of modification of the portions of the reaction vessel surrounding the newly formed cubic diamond occurs in all cases as a result of the outward conduction of heat from the extremely hot sample 38. This modification, however, occurs when the discharge of electric current has been substantially depleted and, thus, occurs too late to affect the cubic diamond growth in any way. Such is not the case when modification occurs from the application of large over-voltages.

Additional examples of the practice of this aspect of the invention are set forth in Table 6. In FIG. 4 reaction cell configurations the same kind of graphite was employed for the sample 38 and also for the discs 34 and 35. In Examples 1-2, the reaction vessel of FIG. 2 was employed. In the remainder of the examples, the reaction vessel of FIG. 4 was employed. The abbreviations used designate the following: SB is Shawinigan black carbon, Py is pyrophyllite, MgO is magnesia, and ThO_2 is thoria.

When the direct conversion of non-diamond carbon to cubic diamond is conducted with the reaction vessel of FIG. 4, the carbon to be converted will convert to electrically conducting cubic diamond and sufficient energy is applied to melt the cubic diamond so formed, the converted sample usually has an appearance much as is shown in FIG. 4b. Three distinct regions are often found (a) an ellipsoidal center section 38b containing both graphite and recrystallized cubic diamond, (b) a lighter colored cubic diamond shell 38c surrounding the center 38b and (c) portions 38d of darker cubic diamond, which had never been melted, at each end of the graphite sample. Portion 38b was subjected to the highest temperature and portions 38c and 38d in turn to lower temperatures. This phenomenon is reported in Table 6 (Results).

The presence of portions 38d in samples wherein recrystallized cubic diamond was also formed explains why the Examples 11, 14, 16 and 17 of Table 5 are the same as Examples 9, 1, 3 and 4, respectively, of Table 6 and display the same pressure and electrical energy inputs. Thus, in conducting the experiments recorded in Table 6 as Examples 9, 1, 3 and 4, the formation of portions 38d accompanying the recrystallized cubic diamond was recorded as Examples 11, 14, 16 and 17 in Table 5. Despite the fact that portions 38d are electrically conducting cubic diamond, the temperature thereof was not raised to the melting point. Likewise, the cubic diamond in Examples 13 and 15 of Table 5, although it would be electrically conducting, was never melted because of the lower energy input.

In the above examples, cubic diamond melting and cubic diamond recrystallization were evidenced by the shape and inflections of the resistance curves and the amount of energy insertion. This behavior, of course, is dependent upon the electrically conductive nature of the cubic diamond formed. In all examples, the center section showed 50% and greater, by volume, of cubic diamond.

A clear illustration of the aspects of this invention previously described is provided by FIG. 10. In FIG. 10, are three curves R_1 , R_2 , and R_3 . The R_1 curve is an exemplary graphite melting curve, R_2 is a curve from a graphite to cubic diamond conversion process, wherein the cubic diamond formed is nonconducting, or at least has not been melted, and R_3 is a resistance curve taken from

The above described example, wherein electrically-conducting cubic diamond is formed and sufficient electrical energy has been introduced to melt the cubic diamond. These examples are essentially duplicates in that the same reaction vessel configuration was used and the energy insertion in kilocalories/moles have been correlated for a standard sample of 0.030 inch diameter and 0.020 inch height. Pressures employed were 118 kilobars for R_1 , 130 kilobars for R_2 , and 145 kilobars for R_3 . The initial rise in the R_3 curve at about 8-10 joules corresponds to the initial rise of the R_2 curve and indicates conversion of the graphite to cubic diamond. A further example, corresponding to the R_3 curve, but with less energy insertion, verified this correlation by reason of recovery of a solid cylindrical cubic diamond compact of a black color.

CONVERSION TO HEXAGONAL DIAMOND WITHOUT MELTING IN THE ABSENCE OF CATALYST

Although the possibility of the existence of a close-packed hexagonal carbon (hexagonal diamond) analogous to the wurtzite phase of boron nitride has been conjectured, the recognition of hexagonal diamond created in the practice of the instant static pressure process has been complicated by two factors. First, X-ray diffraction patterns of the crystalline mass recovered always shows (in addition to the characteristic lines of hexagonal diamond [2.19 Å., 1.92 Å., 1.17 Å. and 0.855 Å.], a very strong 3.1 Å. line, previously not correctly explained, and second, the lines characteristic of cubic diamond [2.06 Å., 1.26 Å., 1.076 Å. and 0.826 Å.], are always present as part of the hexagonal diamond lattice. Thus, many crystalline products produced in the practice of this invention were understandably erroneously identified as cubic diamond and in those cases in which attempts were made by an expert crystallographer to factor in the 3.1 Å. and 2.19 Å. lines, the hexagonal lattice reconstructed therefrom has a calculated density considerably lower than the measured density of the crystalline mass. Finally, it was discovered that the 3.1 Å. line was not part of the crystal lattice spectrum, but was actually due to entrapped graphite crystallites under pressure. Once this identification had been made, then the crystallographic reconstruction and correct identification of the close-packed hexagonal diamond lattice was accomplished from the X-ray diffraction data. This form has essentially the same interatomic spacing, density, hardness and index of refraction as cubic diamond, but has a different stacking pattern of the atomic planes. The hexagonal diamond lattice is described as: $a=2.52$ Å., $c=4.12$ Å., space group $P6_3/mmc$.— D_{6h}^{14} , 4 atoms per unit cell in $4(\bar{r}), \pm(\frac{1}{3} \frac{2}{3} z, \frac{2}{3} \frac{1}{3} \frac{1}{2} + z)$ with $z=\frac{3}{8}$. The calculated density of hexagonal diamond is 3.51 g./cm.³, the same value as for cubic diamond. Hexagonal diamond scratches sapphire easily (a hardness test generally employed for detecting cubic diamond), in the polycrystalline form it has a measured density of greater than 3.33 g./cm.³, the electrical resistivity is several orders of magnitude higher than that of graphite, and the electrical resistance anisotropy is less than two in the different crystal directions.

Thus, of the examples shown in Table 7, Examples 1-6, 11, 12 and 21 were earlier thought to have resulted solely in cubic diamond, the only form of diamond then actually identified. However, as has been indicated, the products were in fact crystalline masses containing hexagonal diamond graphite under pressure and varying amounts of cubic diamond. As may be seen comparing Table 5 and Table 7, hexagonal diamond appears to require particular starting materials. All of the materials successfully employed in the production of hexagonal diamond are well-crystallized graphites with good c-axis orientation, that is, the c-axes of the component graphite crystallites are substantially parallel to each other. When a specimen of any well-crystallized oriented graphite material from which it is desired to prepare hexagonal diamond is placed in a

pressure apparatus, such for example as has been described hereinabove, in such a way that it will be compressed by the apparatus mainly in the *c*-direction of the graphite crystals, and the specimen is subjected to an operating pressure of at least about 130 kilobars, a phase change occurs, this phase change being manifest by a very large increase (over 60,000 times the initial value) in electrical resistance. The onset of the change of phase is manifest even without heating the sample. Once the operating pressure has been reached the reaction (conversion to the new phase) can be greatly accelerated by heating the sample. Since the temperatures necessary in the practice of this aspect of the invention need not exceed 2000° C. static (steady AC) heating of the sample can be employed as described hereinabove. However, unless the temperature is raised to at least about 1000° C., the new crystalline structure will not survive decompression and will revert to graphite during the last part of the decompression. By raising the temperature of the sample to at least about 1000° C., the new phase, hexagonal diamond, is "set" and survives decompression yielding a polycrystalline mass containing hexagonal diamond crystallites.

The transformation from graphite to hexagonal diamond is a solid-to-solid one, that is, it does not involve an intermediate fluid state of any kind. There is a definite preferred orientation relationship between the parent graphite crystal and the hexagonal diamond crystals created therefrom. The *c*-axis of the hexagonal diamond formed lies perpendicular to both the *c*- and *b*-axes of the graphite, while the *b*-axes are common. The transformation of one crystal form to the other is more complicated than simple shear displacement of the graphite atomic planes. The fit of one lattice to the other is only two-dimensional and it appears that diffusion must occur for further growth of the hexagonal diamond crystal nuclei. This may be the reason that a minimum "setting" temperature is required. It also appears to be the reason that in all specimens prepared to date compressed microcrystal graphite inclusions are always present within the hexagonal diamond material. The shift of the value, and the width, of the primary graphite X-ray diffraction line (3.35 Å. to about 3.1 Å) indicates that the trapped graphite crystallites are present under a residual pressure of about 50 kbar.

Example of graphite starting materials, which have been used successfully are: natural "single" crystals, as for example, from Madagascar or Ticonderoga; highly annealed pyrolytic graphites; compacts made of SP-1, a commercial very high purity flake powder graphite of good crystal perfection described hereinabove. The important general requirements are first, the material must be quite well crystallized (that is the crystallite domains must be relatively large and perfect); and second, the *c*-axes of the crystallite domains must be well aligned in a given direction. Hexagonal diamond cannot, for example, be prepared from spectroscopic graphite, which does not meet these criteria.

Examples 1-8, 11, 12 and 21 employed transient heating whereby the temperatures were carried to temperatures beyond line Th (FIG. 7), while indirect heating was employed in the balance of the diamond-making runs. The indirect heating was accomplished by using a modified construction of the reaction vessel shown in FIG. 2 in that heated elements of tantalum, titanium or platinum were disposed around the graphite sample or extending along the top and bottom of the graphite sample separated therefrom by mica and electrical contact is made with the heater elements to effect resistance heating (steady AC heat). The abbreviations Py, Tic, Magr and Hex represent, pyrophyllite, Ticonderoga, Madagascar and hexagonal, respectively. Apparently, the parameter of time is not critical, because the transient heating occurs for only a short period. However, the steady AC heated examples were heated in some cases for several hours producing yields of 70-90% hexagonal diamond.

TABLE 7

Example No.	Reaction vessel	Confining matl. for sample	Sample type of graphite	Pressure, kilobars	Heating	Type of diamond produced
1	Figure 4	Py	Annealed pyrolytic	110	16 volts, 0.040 farads	Hex. and cubic.
2	Fig. 4	Py	do	130	27 volts, 0.040 farads	Do.
3	do	Py	do	125	36 volts, 0.040 farads	Do.
4	Fig. 4	Py	do	139	25 volts, 0.040 farads	Do.
5	Fig. 2	Py	do	130	18 volts, 0.065 farads	Do.
6	do	Py	do	130	22 volts, 0.085 farads	Do.
7	Fig. 4	Py	do	>110	16 volts, 0.085 farads	Do.
8	do	Py	do	140	25 volts, 0.042 farads	Do.
9	Fig. 2	Py	do	150	Steady AC heat temp., >1,000° C.	Mostly hex., small amount cubic.
10	do	Mica	do	160	do	Do.
11	Fig. 4	Py	SP 1	139	34 volts, 0.040 farads	Hex. and cubic.
12	do	Py	do	120	30 volts, 0.040 farads	Do.
13	Fig. 2	Tantalum	SP 1	160	Steady AC heat temp., >1,000° C.	Do.
14	do	do	Annealed pyrolytic	160	do	Mostly hex., some cubic.
15	do	Titanium	do	160	do	Do.
16	do	do	do	160	do	Hex. and cubic.
17	do	Platinum	do	>220	Steady AC heat temp., >1,500° C.	Do.
18	do	do	do	>160	Steady AC heat temp., >1,800° C.	Do.
19	do	do	do	>220	do	Do.
20	do	do	do	>300	Steady AC heat temp., >2,000° C.	Mostly hex., some cubic.
21	do	Py	11C	130	14 volts, 0.085 farads	Hex. and cubic.
22	do	Platinum	11C	>230	Steady AC heat temp., >1,800° C.	Do.
23	do	do	Mag [†]	>200	Steady AC heat temp., >2,000° C.	Mostly hex., some cubic.
24	do	do	Mag [†]	>200	Steady AC heat temp., >1,800° C.	Do.

† Sample Rectangular .013" X 0.37".

An example of a demonstration in which hexagonal diamond was produced in good yield is as follows: the apparatus was a 600-ton high compression "belt." The specimen was highly annealed prolytic graphite .009" thick x .048" wide x .240" long (FIG. 2). The *c*-axis of the graphite was perpendicular to the .048" x .240" dimensions. The graphite was surrounded by pyrophyllite stone. One end was connected by a .023" diameter copper electrode to the top piston face and the other end by a similar electrode to the bottom piston face. The graphite was compressed in the *c*-axis direction. During compression at room temperature the resistance of the specimen varied as shown in FIG. 11: it remained practically constant until about 2000 p.s.i. ram oil pressure was reached, at which point the resistance turned upward. Over a period of 6 minutes, standing at room temperature, the resistance increased from .028 to .035 ohms. After 24 more minutes, when the power had been turned up to 145 watts (15 v., 95 A.), the resistance of the graphite reached 1.6 ohms. Heating of the sample was generated by passage of the current through the graphite and the temperature midway along the length of the graphite specimen (element 32, FIG. 2), where the hexagonal diamond is formed, surpassed 1500° C. When the applied voltage reached 20 v. the reaction proceeded very rapidly, and although the voltage was increased considerably the current dropped so much that the power input decreased. At 70 v. the current was only slightly above zero. The heating circuit was then removed and the resistance of the sample was measured with an ohmmeter and observed to be 2550 ohms.

During unloading of the press the resistance of the specimen remained essentially constant down to 400 p.s.i. ram oil pressure. There it began to decrease due to partial reversion of the specimen to graphite. From 200 p.s.i. on down the specimen resistance increased again due to deformation of the specimen, contact resistance, etc. After removal from the apparatus it was found that the midspan part of the specimen (the part, which had been hot-test) was gray in color, very brittle and hard. It would scratch sapphire readily, a hardness test generally employed for diamond. The X-ray diffraction pattern of this part displayed the following reflections:

dA.	Intensity
3.4	weak.
3.1 +	very strong.
2.19	strong.
2.06	medium.
1.95	medium weak.
1.55	weak.
1.255	medium strong.
1.17	weak:
1.075	medium.

The weakness of the 3.4 A. line indicates almost complete absence of unconverted graphite. The strong 3.1 A. line shows the presence of considerable (up to about 20% by volume) trapped compressed graphite. The remainder of the spectrum is characteristic of hexagonal diamond.

The X-ray diffraction pattern of a part of the specimen that was closer to the copper electrodes, where the maximum temperature had been lower than at midspan (which exceeded about 1500° C.), showed hexagonal diamond, ordinary hexagonal graphite and some rhombohedral graphite. Since the spectrum of hexagonal diamond includes all the regular cubic diamond lines it is possible that both parts of the specimen tested could have contained some cubic diamond also. However, the 2.19 A. line was stronger than the 2.06 A. line in both cases, so the fraction of cubic diamond, if any, was quite small compared to hexagonal diamond.

A piece of the midspan part was float-tested in density fluids. It was about neutral in methylene iodide which has a density of 3.33 g./cm.³. Thus the average density of the polycrystalline material was about 3.33 g./cm.³ (compared to the theoretical density of single-crystal hexagonal, or cubic, diamond of 3.51 g./cm.³).

In each instance the crystalline mass, the product of the reaction, contained hexagonal graphite modified with tiny inclusions of compressed graphite even after chemical treatment to remove any ordinary graphite present.

This process, therefore, makes available the conditions for producing a new abrasive material, which hitherto would have been available as a natural

material in very small amounts, being created by the extremely high transient pressures and the transient adiabatic temperature increase occurring in a meteorite at and by the shock of impact. This latter occurrence appears to be the only source of natural hexagonal diamond.

In the practice of this invention as set forth herein one preferred form of the apparatus and one preferred circuit have been employed. Other apparatuses are available and are known in the art, which will provide the given conditions, more particularly, apparatus capable of providing pressures at least about the iron transition in the general range of 120-135 kilobars. The "belt type" apparatus as illustrated in FIG. 1 may be scaled up in size and/or the reaction vessel configuration may be suitably changed to provide a larger reaction volume for the practice of this invention. For the production of transient heating the circuit employed may also be altered, the more important requirement being that the circuit will discharge the necessary energy in a shorter period of time compared to the period of time for melting or occurrence of deleterious chemical reactions in the wall materials. As a result, the sample material reaches the required temperature and commences cooling before the surrounding materials have absorbed too much heat. Consequently, with the advent of better temperature resistant materials, the temperature rise time may be lengthened. Accordingly, the ordinary slow resistance heating method as described in the aforementioned U.S. Patent 2,941,248, Hall, might be employed. Temperature rise may be considerably varied in the practice of this invention with the material as described. Variance is accomplished by utilizing different inductance capacitance and voltages for circuit discharge purposes. In Table 5, this difference ranging from 30 volts on .040 farad to 16 volts on .085 farad corresponds to a time delay of temperature rise of about $2\frac{1}{2}$ milliseconds.

The reaction is differentiated in one respect over the reactions described in the aforementioned Patent 2,947,610 in that no molten metals are present in this invention. In the previous patent disclosure as mentioned, the metals as employed are required to become molten at the indicated conditions. In this invention no molten metals are present because no metals are employed, and conversion temperatures obtained preclude gross melting of graphite although some restrictive domain type melting may occur. In the higher temperature ranges, the rapidity of the reaction is such that the conversion temperature is reached in the graphite and cooling is commencing before high temperatures are reached in the surrounding materials.

Representative examples of the teachings of this invention were duplicated in order to determine the effect of the previously required metals on this conversion process. For example, the reaction vessel of this invention was assembled as illustrated in FIG. 2 and an operation as described with respect to Table 5 produced cubic diamond. A second operation duplicated the first but contained a mixture of graphite and nickel powder, nickel being one of the metals previously required. After the operation, an examination of the contents or center portion of the reaction vessel revealed no different reaction or product. The cubic diamond produced was the same in both instances. On the other hand, the nickel powder was relatively unchanged because the reaction time was so short that catalysis did not occur. Repetition of the above process with other metals indicated no apparent change, and the reactions took place without being affected by the added metal.

During the pressure-temperature operation or conversion process, the reaction vessel 20 and sample 32 maintain, generally, their geometrical integrity. This is particularly true of sample 38 of FIG. 4. In the FIG. 4 geometry the full diameter of the center portion of sample 38 is converted to a polycrystalline mass as illustrated in FIG. 4a as 38a. Therefore, cubic or hexagonal diamond may be recovered in various predetermined polycrystalline configurations predicated upon the original cross-sectional configuration of the graphite sample. Variations in sample design of FIG. 2 and other design configurations, and the charge given to circuit 41 may also be provided to lead to substantially all of the graphite sample being converted to cubic diamond. At present the sample recovered from the reaction vessel configuration of FIG. 2 is illustrated in FIG. 2a as a rectangular barlike form 32a comprising about the central $\frac{1}{3}$ length of the former sample 32 intermediate its longitudinal dimension. The cross section is rectangularly shaped while the end sections are slightly rounded. When the original graphite sample is oriented graphite, i.e., annealed pyrolytic graphite properly oriented in the pressure apparatus, the hexagonal

diamond compact is composed of hexagonal diamond crystals with corresponding orientation.

One of the salient features of this invention is control. Both temperature and pressure may be individually controlled. For example, practice of this invention may include providing a desired pressure for a given material and changing that pressure for various purposes. Thereafter, circuit 41 may be discharged at predetermined voltage-farad conditions. The minor pressure rise estimated to be less than about 10-20 kilobars, attributable to quick heating has been found not to appreciably affect the control of pressure for this invention. Thus, pressures and temperatures are independent of each other. For example, in FIG. 7, after a conversion to hexagonal or cubic diamond, pressures are maintained in the diamond stable region above the graphite to diamond equilibrium line E for all temperatures which at lower pressures would cause graphitization of the diamond product. For the reverse conditions any diamond (hexagonal or cubic) formed would be graphitized. This may be more particularly described, with respect to FIG. 7, and denotes the prime importance of control. Additionally, control of pressure includes raising and lowering pressure in any desired increments. The independent control features are thus important elements in the practice of this invention.

This invention is described with respect to a static pressure apparatus in which graphite to hexagonal or cubic diamond conversion takes place. In such an apparatus, static pressure may be applied as a first step with variable and long term delay, if desirable, before temperature is raised or circuit 41 discharged. A slow pressure rise is preferred to provide uniform conditions in the various materials. Slow is indicative of operation in minutes preferably but includes operation in seconds. Stability of pressures over a reasonable time limit provides more favorable operation and more complete conversion and, therefore, larger crystallites. While both pressure and temperature are controlled, pressure is more subject to control because it is maintained under control after any initial application thereof to the final pressure. Controlled pressure is thus differentiated from shock wave pressures because it is a maintained pressure rather than a transient one and because the time rate of change of pressure may be controlled. (One example of a shock or explosive method is described in British Patent 822,363, Oct. 21, 1959.) The reaction time may then be correlated with temperature rise only, this time being generally within about 1 to 5 milliseconds. The length of the time range, however, is only predicated on the materials utilized in the apparatus. While pressure may be raised incrementally in one or more increments so also temperature rise may be in increments when using, an ordinary resistance heating circuit, delayed thermite reactions, or additionally by raising the temperature to a given value below the threshold temperature and then utilizing capacitor discharge for completion of the temperature rise.

Of the various forms of graphite which have been employed in this invention, conversion to cubic diamond has been obtained from hexagonal graphite, graphite containing rhombohedral graphite, and from various kinds of graphite, with pressure being applied either perpendicular or parallel to the c-axis of the graphite crystals. In this invention, graphite samples have been inserted in the reaction vessels with the crystal planes both perpendicular to and parallel to punch faces 19. In the preparation of hexagonal diamond well-crystallized graphite must be used and disposed with the latter orientation; namely, with the c-axis orientation parallel to the direction of compression.

In summary, the practice of this invention to produce cubic diamond includes both operation within region D₂ (including area A) with pressures ranging from about 125 to 400-500 kilobars and entry into region L therefrom and return thereto to recrystallize cubic diamond. By separate or external heating means (as opposed to temperature rise by compression or shock), temperatures may be increased to about 4000° K. A preferred temperature ranging is about 2800-4000° K.

The production of hexagonal diamond employs a minimum pressure of about 130 kilobars and the simultaneous application of heat to raise the temperature to in excess of about 1000° C. for about a period of at least two minutes (FOR static heating) in the well-crystallized graphite employed. In the case of transient heating the "setting" time is in the order of milliseconds.

Both hexagonal and cubic diamond obtained by means of this invention is widely applicable for industrial purposes in the same manner as natural cubic diamonds, for example, as polishing, abrading or cutting materials.

While a specific method and apparatus in accordance with this invention is described and shown, it is not intended that the invention be limited to the particular configuration illustrated, and it is intended by the appended claims to cover all modifications within the spirit and scope of this invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A static pressure method for converting a carbon material to cubic diamond in the absence of a catalyst in a high pressure high temperature apparatus which comprises the steps of:

placing a quantity of material containing carbon in a high pressure high temperature apparatus,

controllably subjecting said quantity of material to pressure sufficient to raise the pressure thereof at least as high as the pressure of the solid diamond-solid graphite-liquid carbon triple point, heating said quantity of material to subject said quantity of material simultaneously to conditions of rising temperature and static pressure to initiate the conversion of carbon to cubic diamond at a first point in area A in FIG. 7 of the drawings and proceed at least to a second point along line M in said FIG. 7 having substantially the same pressure as said first point in less than about 5 milliseconds,

returning the quantity of material so treated to ambient conditions of pressure and temperature and

recovering cubic diamond from said quantity of material so treated.

2. The method for converting carbon material to cubic diamond substantially as recited in claim 1 wherein the static pressure reached is at least about 120 kilobars and the material is graphite.

3. The method for converting carbon material to cubic diamond substantially as recited in claim 1 wherein the discharge of electric current through the quantity of material occurs in less than one-half second.

4. The method for converting carbon material to cubic diamond substantially as recited in claim 3 wherein the minimum energy insertion per unit weight of carbon present is about 16 kilocalories/mole of carbon.

5. The method for converting carbon material to cubic diamond substantially as recited in claim 1 wherein the pressure and temperature are raised independently.

6. The method for converting carbon material to cubic diamond as recited in claim 1 where in the heating is accomplished at least in part by the discharge of electric current through the quantity of material.

7. A static pressure method for converting a carbon material to cubic diamond in the absence of a catalyst in a high pressure high temperature apparatus which comprises the steps of:

placing a quantity of a material containing carbon and an impurity in a high pressure high temperature apparatus,

said impurity being effective to render electrically conductive the diamond material produced from said carbon by the application of high pressures and high temperatures,

controllably subjecting said quantity of material to pressure sufficient to raise the pressure thereof at least as high as the pressure of the solid diamond-solid graphite-liquid carbon triple point with the temperature of said quantity of material being less than the temperature of said triple point,

heating said quantity of material above the melting point of cubic diamond at a pressure above the pressure of said triple point while maintaining the pressure thereof above the pressure of said triple point,

said raising of temperature being effected at least in part by discharging an electric current through said quantity of materials,

reducing the temperature of the quantity of material so treated to pressure-temperature conditions in the diamond stable region of pressures and temperatures on the phase diagram of carbon while maintaining the pressure thereof above the pressure of said triple point,

returning said quantity of material so treated to ambient pressure and temperature conditions, and

recovering cubic diamond formed in said quantity of material so treated.

8. The method for converting carbon material to cubic diamond substantially as recited in claim 7 wherein the impurity is a source of boron atoms.

9. The method for converting carbon material to cubic diamond substantially as recited in claim 7 wherein the source of carbon is graphite.

10. The method for converting carbon material to cubic diamond substantially as recited in claim 7 wherein the static pressure reached is at least about 120 kilobars and the temperature reached is at least about 4000° Kelvin.

11. The method for converting carbon material to cubic diamond substantially as recited in claim 7 wherein the discharge of electric current takes place in greater than two milliseconds and less than one-half second.

12. The method for converting carbon material to cubic diamond substantially as recited in claim 7 wherein the minimum energy insertion per unit weight of carbon present is about 22 kilocalories/mole of carbon.

13. The method for converting carbon material to cubic diamond substantially as recited in claim 7 wherein the pressure and temperature are raised simultaneously.

14. In a static pressure method for converting carbon material to a diamond crystal lattice structure in a high pressure, high temperature apparatus wherein a quantity of material containing carbon is subjected to static pressure and heat is then applied thereto, the improvement comprising:

- (a) placing a quantity of well-crystallized graphite consisting essentially of the hexagonal form, the crystallites of which have their *c*-axes in substantial parallel alignment, in the high pressure, high temperature apparatus with the *c*-axis alignment of said quantity of graphite disposed in the direction of compression of said quantity of graphite,
- (b) heating said quantity of graphite in the absence of catalyst under static pressure at least as high as the pressure of the solid diamond-solid graphite-liquid carbon triple point to a temperature of at least about 1000° C.,
- (c) returning the quantity of graphite so treated to ambient pressures and temperatures, and
- (d) recovering hexagonal diamond material from said quantity of material so treated.

15. The improvement substantially as recited in claim 14 wherein the quantity of graphite is annealed pyrolytic graphite.

16. In a static pressure method for converting carbon material to a diamond crystal lattice structure in a high pressure, high temperature apparatus wherein a quantity of material containing carbon is subjected to static pressure and heat is then applied thereto, the improvement comprising:

- (a) placing a quantity of well-crystallized graphite consisting essentially of the hexagonal form, the crystallites of which have their *c*-axes in substantial parallel alignment, in the high pressure, high temperature apparatus with the *c*-axis alignment of said quantity of graphite disposed in the direction of compression of said quantity of graphite, and
- (b) heating said quantity of graphite in the absence of catalyst under static pressure at least as high as the pressure of the solid diamond-solid graphite-liquid carbon triple point to a temperature of at least about 1000° C.

17. The improvement substantially as recited in claim 16 wherein the quantity of graphite is annealed pyrolytic graphite.

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U.S. Cl. XR.

EXHIBIT C

U.S. PATENT OFFICE—3,551,120—PATENTED DEC. 29, 1970

3,551,120

SUBSTITUTED DODECARBORATES

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No Drawing. Continuation-in-part of applications Ser. No. 15,042, Mar. 15, 1960, Ser. No. 30,443, May 20, 1960, and Ser. No. 141,248, Sept. 25, 1961. This application Dec. 21, 1962, Ser. No. 246,636

Int. Cl. C01b 6/22

U.S. Cl. 23—358

35 Claims

This application is a continuation-in-part of our applications, Ser. No. 15,042, filed Mar. 15, 1960, and Ser. No. 30,443, filed May 20, 1960, both now abandoned and of our copending application, Ser. No. 141,248, filed Sept. 25, 1961, now abandoned.

This invention relates to new compounds containing boron and to methods for preparing the compounds.

Boron compounds, particularly boron hydrides, have achieved technical importance in recent years. However, there are many potential applications for which boron compounds including boron hydrides, halides and alkyls, cannot be used because of hydrolytic, oxidative and other types of instability. To illustrate, diborane, chlorodiborane, pentaborane(9) and trialkylboron compounds are spontaneously flammable in air. Diborane, pentaborane(9), chlorodiborane, boron trichloride, dodecaborane(14) and most other boron halides are hydrolyzed rapidly in water or alcohol. Even the most stable known borohydride, i.e., decaborane(14), is hydrolyzed at a moderate rate in water. Known ionic borohydrides, e.g., tetrahydroborates (NaBH_4 and the like), are hydrolyzed at a rapid rate at 100°C .

This invention is directed to a broad class of boron compounds which have stability characteristics that are unusual for boron compounds. The compounds of the invention generally show hydrolytic, oxidative and chemical stabilities normally associated with aromatic organic compounds.

The novel boron compounds are ionic in character and they are represented generically by the following formula:



M is a cation, i.e., an atom or group of atoms which forms a positively charged ion in aqueous solution, which cation has a positive ionic charge or valence of 1-4; $(\text{B}_{12}\text{H}_{12-y}\text{X}_y)$ is a group which forms a divalent anion in aqueous solution, i.e., an ion which carries a negative charge of 2; X is a monovalent group capable of bonding to carbon of a benzene nucleus by replacement of hydrogen bonded to said carbon; y is an integer, i.e., a positive whole number, of 1 through 12; a and b are positive whole numbers of 1 through 3 whose respective values are determined by the valence of M, i.e., a multiplied by the valence of M is equal to 2b. The X groups, when more than one is present, can be alike or different.

The novel compounds of this invention may also be defined as derivatives of the acid $\text{H}_2\text{B}_{12}\text{H}_{12}$ and its salts wherein at least one hydrogen of the $\text{B}_{12}\text{H}_{12}^{2-}$ anion is replaced by an X substituent. The component X comprises a broad group of substituents for which representative illustrations are given in the examples in later paragraphs.

In the compounds of Formula 1 the novel and characterizing component is the boron-containing group shown in parentheses, i.e., $(\text{B}_{12}\text{H}_{12-y}\text{X}_y)^{2-}$. This group behaves as a stable chemical entity in conventional reactions and it will be discussed more fully in later paragraphs with particular reference to the substituent X.

The group M

In generic Formula 1 M is a group which can be composed of one or more than one element and which is ionically bonded to the boron-containing group. The groups represented by M bear a positive ionic charge and they have in common the property of forming positively charged groups or cations in water.

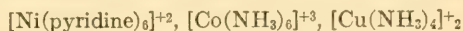
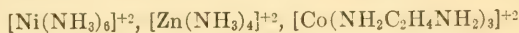
The principal function of the group M is to provide an element or group of elements which bear the necessary positive charges to combine with the novel anion, i.e., $(B_{12}H_{12-y}X_y)^{-2}$, and thus permit its isolation as part of a stable compound.

The properties of the group M are not critical and the group therefore represents a broad range of elements or combinations of elements. To illustrate, M can be hydrogen, hydronium (H_3O^+), a metal, ammonium (NH_4^+), hydrazonium ($NH_2NH_3^+$) (also called hydrazinium), N-substituted ammonium, N-substituted hydrazinium ($CH_3NHNH_3^+$), aryldiazonium (ArN_2^+), sulfonium, phosphonium, metal-ammine, 2,2'-bipyridinium, quinolinium, phenazonium, N-alkylpyridinium, and the like.

The group M can be derived from any metal. The metals according to the Periodic Table in Deming's "General Chemistry," 5th ed., chap. II, John Wiley & Sons, Inc., and in Lange's "Handbook of Chemistry," 9th ed., pp. 56-57, Handbook Publishers, Inc. (1956) are the elements of Groups I, II, VIII, III-B, IV-B, V-B, VI-B, VII-B, and the elements of Groups III-A, IV-A, V-A and VI-A which have atomic numbers above 5, 14, 33 and 52, respectively. The metals can be light or heavy metals. To illustrate, M can be lithium, sodium, potassium, cesium, beryllium, barium, lanthanum, zirconium, vanadium, manganese, iron, cobalt, copper, zinc, mercury, aluminum, thallium, tin, lead, antimony, bismuth, silver or any other metal. Preferred metals are those whose valences are 1-3, inclusive.

An especially preferred group of metals from which M can be derived consists of elements of Groups I-A, II-A, I-B and II-B having atomic numbers up to and including 80. Most preferred metals are the alkali and alkaline earth metals, i.e., lithium, sodium, potassium, rubidium, cesium, beryllium, magnesium, calcium, strontium and barium.

The group M can be a combination of a metal and ammonia or a metal and an amine, i.e., a Werner-type coordination complex referred to as a metal-ammine group. To illustrate M can be



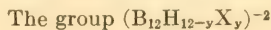
and the like. The group can be a metal with water of hydration, e.g., $[Cu(H_2O)_4]^{+2}$, $[Ni(H_2O)_6]^{+2}$, and the like.

The group M can be aryldiazonium, i.e., a group of the formula ArN_2^+ , where Ar represents an aryl group. To illustrate, Ar can be phenyl, tolyl, xylyl, naphthyl, and the like.

The group M can be an N-substituted ammonium radical, an S-substituted sulfonium group and a P-substituted phosphonium group of the formula RNH_3^+ , $R_2NH_2^+$, R_3NH^+ , R_4N^+ , R_3S^+ , and R_4P^+ . R represents an organic group bonded to the nitrogen, sulfur or phosphorus. The R groups are not critical features of these cation groups; thus, R can be open-chain, closed chain, saturated or unsaturated hydrocarbon or substituted hydrocarbon groups. R can be a heterocyclic ring of which the nitrogen, sulfur or phosphorus atom is a component part. Thus, when M is a substituted ammonium group, R can be derived from pyridine, quinoline, morpholine, hexamethylenimine, and the like. Preferably R, for reasons of availability of reactants, contains at most 18 carbon atoms. For example, R can be methyl, 2-ethylhexyl, octadecyl, allyl, cyclohexyl, cyclohexenyl, phenyl, naphthyl, anthryl, cyclohexylphenyl, diphenyl, benzyl, chloroethyl, ω -cyanoamyl, β -hydroxyethyl, p-hydroxyphenyl, and the like.

The group M can be N-substituted hydrazonium (also called hydrazinium) radicals having the formulas $(RNHNH_3)^+$, $(R_2NNH_3)^+$, and the like, wherein R has the same definition as given in the preceding paragraph. To illustrate, the hydrazonium cation can be derived from phenylhydrazine, methylhydrazine, 1,1-dimethylhydrazine, 1,2-dimethylhydrazine, ethylhydrazine, 1,1-diethylhydrazine, and similar compounds.

The valence of the cation M will be between 1 and 4, i.e., M can have a valence of 1, 2, 3, or 4. In most cases the valence of M will be 1 or 2 and this group of compounds in which the valence of M is at most 2 are readily preparable and so form a preferred group of compounds in this invention.

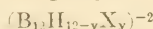


The novel feature of the compounds of Formula 1 is the polyhydropolyborate group, $B_{12}H_{12-y}X_y$, which carries an ionic charge of -2 and which forms a divalent

anion in aqueous solution. The values of a and b in generic Formula 1 are, therefore, determined by the valence of M and they are the smallest whole numbers which satisfy the following equation:

$$b = \frac{a \times \text{valence of } M}{2}$$

The pertinent feature in the novel group,



is the substituent X , which is bonded to boron. The number of substituents which can be present in the group is not less than 1 or more than 12 and the substituents can be alike or different.

In its broadest aspects, X is a monovalent group which has the characterizing property of forming $X-C$ bonds where C represents a carbon which is a nuclear member of a benzene ring and where the $X-C$ bond is formed in place of an $H-C$ bond. The property of forming $X-C$ bonds, where C is nuclear carbon as defined above, is common to all the groups which are represented by X .

The group X can represent a substituent introduced into the $B_{12}H_{12}^{-2}$ anion by direct reaction or it can represent a substituent obtained by subsequent chemical modification of a group which has been introduced by direct reaction, e.g., a substituent obtained by reduction, esterification, hydrolysis or amidation of directly introduced groups.

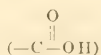
Compounds of the invention are obtained by processes which employ as a principal reactant a salt or acid having the $B_{12}H_{12}^{-2}$ anion, i.e., a compound of the formula $M_a(B_{12}H_{12})_b$, where M , a and b have the meanings given in previous paragraphs.

The salts or acid having the $B_{12}H_{12}^{-2}$ anion (called dodecahydrododecaborates) are compounds whose infrared spectra consistently include strong absorption bands at $4.0\mu \pm 0.1$ and $9.35\mu \pm 0.1$. These bands are an identifying characteristic of dodecahydrododecaborate anions in which the absorption at $4.0\mu \pm 0.1$ is due to $B-H$ stretching and at $9.35\mu \pm 0.1$ is due to the dodecaborate cage.

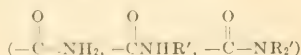
The dodecaborate anion is referred to above as a dodecaborate cage. The B^{11} nuclear magnetic resonance spectra of dodecahydrododecaborate salts have been determined and the data indicate that the dodecahydrododecaborate anion contains one and only one type of boron atom, i.e., all the borons are chemically equivalent. The data further indicate that each boron atom is bonded to only one hydrogen atom and that all the hydrogen atoms are chemically equivalent. These data are best explained by assigning to the dodecahydrododecaborate anion a spatial configuration wherein the boron atoms form an icosahedron in which all the boron atoms are equal (in the same sense that all carbon atoms in benzene are equal) and each boron is bonded to one hydrogen. A complete analysis of infrared and Raman spectra show the dodecahydrododecaborate anion to have, in fact, I_h symmetry. The spatial configuration of this dodecahydrododecaborate anion can be described most aptly as an icosahedron of boron atoms.

One or more hydrogens in the $B_{12}H_{12}^{-2}$ anion can be replaced with groups or substituents to whatever degree desired. Substitution in the $B_{12}H_{12}^{-2}$ anion can, of course, lead to a shift in the absorption bands and the characteristic bands for the substituted B_{12} anion may vary from the wavelengths given earlier for the unsubstituted $B_{12}H_{12}^{-2}$ anion. Complete substitution of all 12 hydrogen atoms will, of course, result in the disappearance of the band at about 4.0μ which is due to $B-H$ stretching.

The substituent X can be introduced directly or indirectly into the $B_{12}H_{12}^{-2}$ anion. One or more groups can be introduced by direct reaction and these groups can be modified by subsequent chemical reactions. Groups which can be introduced by conventional processes and which employ readily available reactants form a preferred class. In this preferred group of compounds of Formula 1, the group X represents one or more of the following substituents: halogens (F, Cl, Br, I), hydrocarbon, carboxyl



carbamyl and N-substituted carbamyl



halocarbonyl



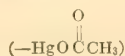
where Y is F, Cl, Br, I, halomethyl ($-\text{CH}_2\text{Y}'$, $-\text{CHY}'_2$ and CY'_3 , where Y' is F, Cl, Br, I), hydroxy ($-\text{OH}$), hydrocarboxy ($-\text{OR}'$), monooxahydrocarboxy ($\text{R}'\text{OR}''\text{O}-$) acetal [$-\text{CH}(\text{OR}')_2$], ketal [$-\text{CR}'(\text{OR}')_2$], hydrocarbon-carbonyloxy [$-\text{OC}(\text{O})\text{R}'$], hydrocarbonoxycarbonyl [$-\text{C}(\text{O})\text{OR}'$], isocyanate ($-\text{NCO}$), thiocyanate ($-\text{SCN}$) isothiocyanate ($-\text{NCS}$), hydrocarbonmercapto ($-\text{SR}'$), hydroxymethyl ($-\text{CH}_2\text{OH}$), hydrocarbonoxymethyl ($-\text{CH}_2\text{OR}'$) aminomethyl ($-\text{CH}_2\text{NH}_2$, $-\text{CH}_2\text{NHR}'$ and $-\text{CH}_2\text{NR}'_2$), cyano ($-\text{CH}$), amino ($-\text{NHR}'$, $-\text{NR}'_2$), thiol ($-\text{SH}$), azido ($-\text{N}_3$), acyl



formyl



nitro ($-\text{NO}_2$) nitroso ($-\text{NO}$), azo ($-\text{N}=\text{N}-\text{Ar}$), where Ar is an aromatic hydrocarbon group of up to 10 carbons), sulfo ($-\text{SO}_3\text{H}$), sulfonyl ($-\text{SO}_2\text{R}'$), and acetoxymercury



R' , where used in the above substituents, is a monovalent organic group which is preferably a hydrocarbon group (alkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl, alkaryl, aralkyl, and the like) of at most 18 carbons, and R'' is a divalent hydrocarbon group of at most 18 carbons.

Many of the compounds of the invention are obtained by reacting the dodecahydrododecaborate(2^-), i.e., the $\text{B}_{12}\text{H}_{12}^{2-}$ salt or acid, with an electrophilic reagent. Substituents introduced by this process into the anion are called hereinafter "electrophilic groups." Compounds of Formula 1 obtained by a process of electrophilic attack form a second preferred class of products of the invention. In this preferred group of compounds of Formula 1, X is defined as a monovalent group which is capable of bonding to carbon of a benzene nucleus by reaction of benzene or a substituted benzene with an electrophilic reagent.

An electrophilic group is a group which is deficient in electrons and which has a point of low electron density. Electrophilic groups and reagents which are employed to effect substitution of such groups for hydrogen on carbon of a benzene nucleus are described in conventional textbooks, of which the following are examples:

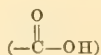
Remick, "Electronic Interpretations of Organic Chemistry," pp. 89-110, Wiley (1943).

Ingold, "Structure and Mechanism in Organic Chemistry," pp. 198-200, 269-304 (especially pp. 202, 211), Cornell University Press (1953).

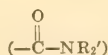
Fuson, "Advanced Organic Chemistry," chap. 1, Wiley (1953).

Wheland, "Advanced Organic Chemistry," 2nd ed., p. 83, Wiley (1949).

Examples of electrophilic groups or substituents, represented by X in Formula 1, which are included in this preferred group are as follows: halogens (F, Cl, Br, I), hydrocarbon ($-\text{R}'$), carboxyl



N,N-disubstituted carbamyl



haloformyl



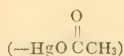
where Y is F, Cl, Br, I, cyano ($-\text{CN}$), trihalomethyl ($-\text{CCl}_3$, $-\text{CF}_3$, etc.), acyl



formyl



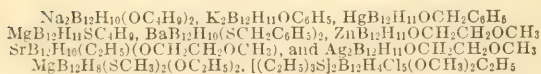
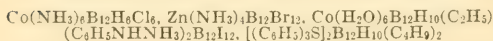
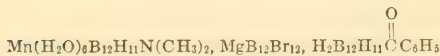
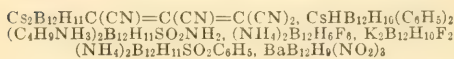
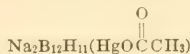
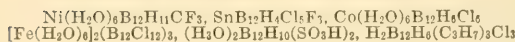
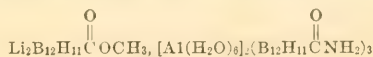
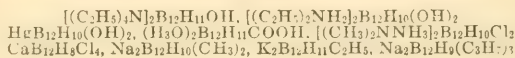
nitro ($-\text{NO}_2$), nitroso ($-\text{NO}$), azo ($-\text{N}=\text{N}-\text{R}'$), sulfo ($-\text{SO}_2\text{H}$), sulfonyl ($-\text{SO}_2\text{R}'$), hydrocarbonoxy (OR'), hydrocarbonmercapto ($-\text{SR}'$), and mercuric acetyl



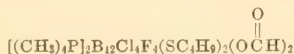
R' , where used in the above substituents is a monovalent organic group which is preferably a hydrocarbon group (alkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl, alkaryl, aralkyl) of at most 18 carbons.

The number of substituents which can be present on the dodecahydrododecarborate(2^-) anion is not less than 1 or more than 12. Thus, the anion $(\text{B}_{12}\text{H}_{12-y}\text{X}_y)^{-2}$, in the generic formula $\text{M}_a(\text{B}_{12}\text{H}_{12-y}\text{X}_y)_b$, can range from $(\text{B}_{12}\text{H}_{11}\text{X})^{-2}$ through successively decreasing hydrogen content to $(\text{B}_{12}\text{X}_{12})^{-2}$.

Examples of the new compounds of the invention, illustrated by formulas, are as follows:



The invention includes within its scope compounds with two or more X groups which are unlike, e.g.,



and the like.

The new compounds are usually solid products which are salt-like in character. Many of the compounds dissolve in water. The color of the compounds is dependent on the nature of the M group and of the electrophilic group bonded to boron. For example, the cupric ammonium salts are bright blue, alkali metal salts are usually white.

Most of the compounds are stable and usually can be handled in a conventional manner. Thus, compounds having halogen, alkyl or acyl substituents are stable and they can be kept in storage for prolonged periods in ordinary containers. However, the precautions usually followed in handling new compositions should be employed.

The scope of the monovalent groups encompassed by X in generic Formula 1 for the compounds of the invention can be understood more clearly by describing methods for obtaining the compounds.

The ionic charge of -2 on the boron-containing anion, which was discussed previously, refers to a charge which is inherent in the boron-hydrogen cage structure. The value of the ionic charge is independently of and does not take into consideration any ionic charge which may reside in the X substituents by virtue of ionizable functional groups. The ions which are formed by ionizable substituents are considered to be part of the X groups and are included within the scope of these groups. For example, carboxyl, sulfo, amino, thiol and like substituents will function as groups which possess acidic or basic properties which are independent of the boron cage structure.

Preparation of compounds

Electrophilic substitution.—In this method, which involves the direct substitution of hydrogen, two reactants are employed which are defined as follows:

(a) a boron-containing compound of the general formula $M_a(BH_{12}H_{12})_b$, wherein M, a and b have the meanings given earlier in generic Formula 1 for the novel compounds.

(b) a reagent capable of introducing an electrophilic group into a benzene nucleus by replacement of hydrogen bonded to a carbon of said nucleus. This second reactant is referred to as an electrophilic reagent.

The characteristics of each group of reactants are discussed in more detail in the following paragraphs.

The boron-containing reactant, $M_a(B_{12}H_{12})_b$, is a dibasic acid or a salt of a dibasic acid which has, as a characterizing group, a divalent anion, $(B_{12}H_{12})^{2-}$. This anion will be referred to as the "dodecahydrododecaborate(2 $^-$) anion" or, for simplicity, as "dodecahydrododecaborate(2 $^-$)."

At this point, it should be noted that the novelty of the compounds of the invention is such that no officially approved system of nomenclature has yet been established. The name "dodecahydrododecaborate(2 $^-$)" follows the lines recommended for naming other boron compounds and its use here permits the logical naming of a derivative of the $(B_{12}H_{12})^{2-}$ anion as a substituted "dodecaborate(2 $^-$)".

Dodecahydrododecaborate(2 $^-$) is an unusual species of divalent anion which has remarkable and unexpected chemical properties. In many respects it shows much greater chemical stability than any previous reported boron hydrides, whether neutral or bearing a charge. For example, the anion is inert to sodium methoxide in refluxing methanol and it does not hydrolyze in water. The anion forms salts with basic materials, e.g., amines and metals, and from these salts there can be obtained a strongly acidic hydronium compound by treatment with an ion exchange resin. Solutions of silver nitrate are not reduced by aqueous solutions containing the $B_{12}H_{12}^{2-}$ anion, a behavior which is in marked contrast to the behavior of other boron hydrides. The stability of the $B_{12}H_{12}^{2-}$ anion to strong bases, strong acids, and oxidizing agents is unique for boron hydride structures.

It is surprising, in view of the chemical stability described above, to find that the dodecahydrododecaborate(2 $^-$) anion undergoes a wide range of substitution reactions in a manner which resembles the behavior of a carbocyclic aromatic compound, e.g., benzene or naphthalene. More specifically, the hydrogens bonded to boron in the $B_{12}H_{12}^{2-}$ group are replaceable by substituents which can also replace hydrogen bonded to nuclear carbon in benzene or a substituted benzene such as toluene. This behavior of the dodecahydrododecaborate(2 $^-$) anion is particularly surprising in view of the completely inorganic composition of the anion. It is the previously unknown "aromatic character" of the dodecahydrododecaborate(2 $^-$) anion which forms the basis of the present invention leading to a broad range of novel substituted dodecaborates(2 $^-$).

It is evident from the above description of the chemistry of the dodecahydrododecaborate(2 $^-$) anion that the second reactant, i.e., the electrophilic reagent, employed in preparing the novel compounds is a reagent which can effect a substitution reaction in a benzene nucleus. These reagents, in view of the extensive work which has been done on substitution reactions in the benzene nucleus, form a well-known group of compounds.

Electrophilic reagents which are broadly operable in the process are reagents which will effect direct substitution of hydrogen bonded to carbon of a benzene

nucleus, i.e., the hydrogen is replaced by a group derived from the electrophilic reagent. Electrophilic reagents are compounds which react by acquiring electrons or acquiring a share in electrons which previously belonged to a foreign molecule (see Ingold, *vide supra*, p. 201). Examples of electrophilic reagents which are within the scope of the above definition and which are operable in the process of the invention are given below, together with the substituent group which in the process is bonded to boron in the final product.

Electrophilic reagent	Electrophilic group bonded to boron
Halogens (F ₂ , Cl ₂ , Br ₂ , I ₂)	Halogen (F, Cl, Br, I)
Cyanogen halides (CNF, CNCl)	Nitrile (CN)
Sulfuric acid	—SO ₂ H
Nitric acid	—NO ₂
H ₂ NO ₃ O ₂ H	—NO ₂
Olefins	—alkyl [e.g., —C ₂ H ₅ , —CH(CH ₃) ₂]
Acetylenes	Alkenyl (e.g., —CH=CH ₂ , —CH=CHR')
$\text{H}_2\text{C}(\text{O}=\text{C}(\text{CH}_3)_2)$	$-\text{H}_2\text{C}(\text{O}=\text{C}(\text{CH}_3)_2)$
$(\text{CN})_2\text{C}=\text{C}(\text{CN})_2$	$-(\text{CN})_2\text{C}=\text{C}(\text{CN})_2$
HNO ₂	—NO
CO/HCl	—COH
R''SO ₂ Cl	—SO ₂ —R''
$\text{R}''\text{N}(\text{O}=\text{C}(\text{CH}_3)_2)\text{Cl}$	$-\text{N}(\text{O}=\text{C}(\text{CH}_3)_2)\text{R}''$
$(\text{R}''\text{OR}'\text{H})+\text{Cl}^-$ (oxonium salt)	—OR''
$(\text{R}''\text{OH}_2)+\text{Cl}^-$ (oxonium salt)	—OH
$(\text{H}_3\text{O})+\text{Cl}^-$ (hydronium salt)	—OH
R''SSR''	—SR''

In the above groups, R'' is a monovalent organic radical, preferably hydrocarbon of at most 18 carbons, which can be alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, aralkyl, and the like.

In the reactions employing some of the above electrophilic reagents, a catalyst may be used, e.g., aluminium trichloride, boron trifluoride and polyphosphoric acid. These catalysts are employed in the same manner as in the well-known procedures in organic chemistry. In some cases the boron compounds themselves function as catalysts, e.g., in alkylation of (H₃O)₂B₁₂H₁₂.

The electrophilic reagents employed in the process are materials which are usually readily available of which are obtained by conventional methods.

It is evident from the above discussion that a wide range of processes is available for the preparation of compounds of the invention. These processes are illustrated more fully in the examples which are given later in the discussion of the invention.

Processes which are employed to introduce one or more X groups on the boron cage are not necessarily identical with the processes employed to introduce the X groups on a benzene nucleus. Consideration must be given to differences in reactivity or in reaction mechanism between a completely inorganic system, as represented by the B₁₂H₁₂²⁻ anion and an organic aromatic system represented by the benzene ring.

It is further noted that in the preparation of compounds of the invention by methods discussed earlier the substituent which ultimately is bonded to boron in the final product is not necessarily the substituent which would be obtained with a process employing a conventional carbocyclic aromatic reactant. To illustrate, reaction of formaldehyde with a dodecahydrododecaborate(2⁻) yields a compound of Formula 1 in which X is —OCH₃ instead of —CH₂OH which might be obtained. Variations of this nature from conventional results are, as mentioned earlier, not unexpected in view of the completely inorganic character of the dodecahydrododecaborate(2⁻) anion. Such variations do not change the view of the basic aromatic character of the boron sphere or cage in the dodecaborate anion.

Differences in preparative procedures or variations in the types of substituents which may be obtained do not change in any way the common characteristics or property of all the X groups, i.e., the property of bonding to a nuclear carbon of a benzene ring.

It is surprising that, despite the inorganic nature of the boron-containing reactant, so many of the processes employed in aromatic chemistry are, in fact, operable in the present invention, e.g., the processes of halogenation, alkylation, acylation, amination and the like. Even more surprising and unexpected is the fact that the X groups bonded to boron in the dodecaborate(2⁻) anion exhibit a chemical behavior in subsequent reactions which resembles closely the behavior of the same X groups bonded to a nuclear carbon of an aromatic ring. This similarity in behavior permits the preparation of a broad range of X substituents bonded to the boron cage.

The boron hydride reactants of the formula $M_a(B_{12}H_{12})_b$ are materials which can be obtained by relatively simple methods from an alkali metal borohydride, e.g., $NaBH_4$, and diborane (B_2H_6). The preparation of representative dodecahydrododecaborates employed as reactants is illustrated in examples given in later paragraphs.

Reaction of the dodecahydrododecaborate(2⁻) salts to obtain the compounds of the invention is conducted in conventional vessels with corrosion-resistant inner surfaces, e.g., glass, platinum, poly(tetrafluoroethylene) resin, and the like. The dodecahydrododecaborate salt $M_a(B_{12}H_{12})_b$ and, optionally, an inert liquid solvent is charged into the reaction vessel. The electrophilic reactant is then supplied to the reaction vessel at a temperature and at a rate which will provide a controllable reaction and which will bring the reaction to completion within a reasonable time. When electrophilic reagents are employed which are hydrolytically stable, water or alcohols (methanol, ethanol) can be used conveniently as a solvent for the reaction. Other solvents can be used, for example, diethyl ether, benzene, heptane, carbon tetrachloride, carbon disulfide and the like.

The temperature at which the reaction is conducted will be determined largely by the reactivity of the electrophilic reagent. In general, the temperature will be between about -20° C. and 150° C. Preferably the temperature will be between, about 0° C. and about 100° C.

The time of reaction in a batch process will also depend to a considerable extent on the reactivity of the electrophilic reagent. The reaction generally proceeds rapidly and, with thorough mixing of the reactants, the time may be as low as 5 minutes or even less. Generally a reaction time between about 10 minutes and 5 hours is sufficient. It is desirable and advantageous to mix the reactants by any suitable means although mixing is not essential for operability. In some cases, e.g., with alkyl halides as the electrophilic reagent, catalysts are used in the process employing the technology of well-known organic aromatic chemistry.

The reaction can be conducted under pressure, if desired, but it is not essential to use pressure. In many cases, the reaction proceeds satisfactorily at atmospheric pressure.

The proportions in which the reactants are used are not critical. It is preferable, in order to obtain maximum yield of desired product, to use at least one mole of the electrophilic reagent for each hydrogen which is to be replaced on the dodecaborate(2⁻) anion. It is not essential, however, that this ratio be used.

The compounds are purified by well-known and recognized procedures. For the majority of products, conventional crystallization procedures are used, employing water or alcohol as solvents. For products of limited solubility, solutions of the compounds can be treated with adsorptive agents, e.g., activated carbon or silica gel, to remove the impurities.

Indirect substitution.—The compounds of the invention can be obtained by processes which are conducted in two or more steps. These processes are generally employed to obtain compounds of Formula 1 in which X is hydroxyl, amine or substituted amine.

In one method of operation, a dodecahydrododecaborate salt, an amide of a carboxylic acid and an aqueous solution of a hydrogen halide, e.g., hydrogen chloride, are reacted, generally with heating.

The product of the reaction is isolated as a metal salt and it is then reacted in a second step with an aqueous solution of an alkali metal hydroxide to obtain a compound of Formula 1 in which X is —OH.

In a second method of operation, hydrates of metal salts of dodecahydrododecaborates are heated under reduced pressure over drying agents to obtain compounds of Formula 1 in which X is —OH. This method is especially useful for obtaining compounds which have a plurality of —OH groups.

Compounds of Formula 1 in which X is amine or a substituted amine are obtained by several methods. In one method a dodecaborate(2⁻), either as the acid or metal salts of the acid, is reacted with an hydroxylamine-O-sulfonic acid,

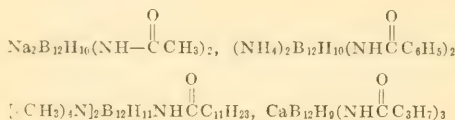
generally in a neutral aqueous solution. The reaction proceeds readily at moderate temperatures and the amine-substituted compound is isolated by conventional procedures.

A second method of preparing compounds bearing amine groups consists in mixing a dodecaborate(2-) acid, e.g., $H_2B_{12}H_{12}$ or, in its hydronium form, $(H_3O)_2B_{12}H_{12}$, and an amide in aqueous solution. The solution is heated until water is removed completely and it is then refluxed. Dilution of the solution with an alcohol, e.g., CH_3OH , followed by addition of a salt having an appropriate cation leads to the isolation of a compound of generic Formula 1 in which X is $-NH_2$, $-NHR'$ or $-NR'_2$.

A second group of products is obtained in this reaction which are compounds of Formula 1 in which X is formyloxy or hydrocarboncarbonyloxy, i.e., $-OC(O)H$ or $-OC(O)R'$. To illustrate, with dimethylformamide as the reactant, compounds of Formula 1 are obtained in which X is $-OC(O)H$; with dimethylacetamide, compounds in which X is $-OC(O)CH_3$ are obtained. This group of compounds is also obtained readily by esterification of the hydroxyl-bearing compounds as described below.

The hydroxyl- and amine-substituted compounds can be used as intermediates for the preparation of compounds of the invention in which X is bonded to boron through oxygen or nitrogen. To illustrate, the hydroxyl-bearing compound is reacted with acids, acid halides or acid anhydrides to obtain compounds in which X represents an ester group [$-OC(O)R'$, or $-OC(O)H$]; with isocyanates to obtain compounds in which X is $-OC(O)NHR'$; with olefins to obtain compounds in which X is $-OR'$; with acetylenic compounds to obtain products in which X is $-OCH=CHR'$; with sulfonyl halides to obtain products in which X is $-OSO_2R'$, and the like. As a further illustration, the amine-bearing compounds can be acylated to give products having groups such as $-NHC(O)R'$ and they can be reacted with isocyanates to obtain compounds having groups such as $-NHC(O)NHR'$. Amine-substituted ($-NH_2$) compounds can also be alkylated, e.g., with dialkyl sulfates, to obtain compounds bearing $-NHR'$ and $-NR'_2$ groups.

In the above description, R' has the meaning defined in an earlier paragraph. To illustrate, by using the appropriate amino-substituted polyborate and acid halide, there can be obtained

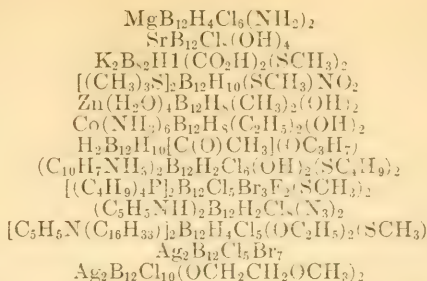


and the like.

Compounds, bearing carboxy groups or esters and amides thereof are obtained by reacting the acid $H_2B_{12}H_{12}$, generally as a hydrate $[(H_3O)_2B_{12}H_{12} \cdot nH_2O]$, where n has a value of up to 13] with carbon monoxide under super-atmospheric pressure. The product thus obtained is dissolved in water or in alcohols to obtain compounds bearing carboxyl groups or esterified carboxyl groups. The product of the carbon monoxide reaction can be reacted with ammonia or amines to obtain compounds bearing amide groups. The compounds are most conveniently isolated in the form of salts, e.g., metal or nitrogen base salts. Products bearing carbacyl halide groups (e.g., $-COCl$), can be obtained by reacting carboxy-substituted compounds with a halogenating agent, e.g., PCl_5 , $AsCl_5$, and the like.

X groups which are not alike.—The processes which have been described can be employed to obtain compounds having one or more X groups. These groups, if more than one is present, can be alike or different. To obtain compounds having two or more X groups which are unlike, the dodecahydrododecaborate is reacted with one electrophilic reagent until the desired number of substituents are introduced and the partially substituted product is then reacted with a second electrophilic reagent. The intermediate partially substituted product can, if desired, be isolated prior to reaction with the second electrophilic reagent. The process can be repeated with a third electrophilic reagent, or even further, until all hydrogens bonded to borons have been replaced. Further modification of various substituent groups can be accomplished by conventional methods to obtain compounds having a broad range of X groups.

To illustrate, compounds of the following formulas can be obtained by the methods described above:



and the like.

In the processes described above, direct replacement of hydrogen bonded to boron by another element or group of elements can occur, i.e., substitution, or the substituent atom or group can be replaced wholly or in part by some other atom or group, i.e., displacement. Whether the reaction is substitution, replacement or displacement, there is no change in the geometry of the dodecaborate cage or dodecaborate moiety.

Metathetic reactions.—Compounds of Formula 1 wherein M covers a wide range of cations are obtained by simple metathetic reactions. To illustrate, an aqueous solution of a compound of Formula 1 where M is NH_4^+ is contacted with a strong acid or with a strongly acidic cation exchange resin to obtain the free acid, i.e., a compound of Formula 1 in which M is H. The acid, generally in solution, is reacted with metals, oxides of metals, hydroxides of metals, salts of metals (both organic and inorganic), nitrogen bases, sulfonium hydroxides or halides, phosphonium hydroxides or halides, arylidiazonium hydroxides or halides, and similar types of compounds to obtain products of Formula 1 which have the desired cation M. In a process employing an ion-exchange resin, strongly acidic resins of the sulfonic acid variety are preferred because of availability, e.g., "Amberlite IR-120H" and "Dowex" 50. The acid, so obtained in aqueous solution, can be reacted with nitrates, chlorides, bromides, acetates, benzoates and similar salts of metals or other bases to obtain salts of Formula 1.

To illustrate, an aqueous solution of $\text{Cs}_2\text{B}_{12}\text{H}_2\text{Cl}_{10}$ is passed through a column packed with "Amberlite IR-120-H" to obtain in aqueous solution the acid $\text{H}_2\text{B}_{12}\text{H}_2\text{Cl}_{10}$. The aqueous solution is evaporated under reduced pressure to obtain the concentrated acid, either as a hydrate of the formula $(\text{H}_2\text{O})_2\text{B}_{12}\text{H}_2\text{Cl}_{10}$ or as the free acid $\text{H}_2\text{B}_{12}\text{H}_2\text{Cl}_{10}$. Examples of other acids which can be obtained and the salts from which they can be derived are as follows:

Compound:	Acid obtained
$\text{Na}_2\text{B}_{12}\text{H}_4\text{Cl}_8$	$\text{H}_2(\text{B}_{12}\text{H}_4\text{Cl}_8)$
$[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{10}\text{Br}_2$	$\text{H}_2(\text{B}_{12}\text{H}_{10}\text{Br}_2)$
$\text{K}_2\text{B}_{12}\text{H}_2\text{Cl}_{10}$	$\text{H}_2(\text{B}_{12}\text{H}_2\text{Cl}_{10})$
$\text{Li}_2\text{B}_{12}\text{Cl}_{12}$	$\text{H}_2\text{B}_{12}\text{Cl}_{12}$
$[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_6\text{I}_2$	$\text{H}_2\text{B}_{12}\text{H}_6\text{I}_2$
$\text{Na}_2\text{B}_{12}\text{H}_{10}(\text{NO}_2)_2$	$\text{H}_2\text{B}_{12}\text{H}_{10}(\text{NO}_2)_2$
$\text{K}_3\text{B}_{12}\text{H}_{11}\text{CN}$	$\text{H}_2\text{B}_{12}\text{H}_{11}\text{CN}$
$\text{Na}_2\text{B}_{12}\text{H}_{10}(\text{C}(\text{CH}_3)_2)$	$\text{H}_2\text{B}_{12}\text{H}_{10}(\text{C}(\text{CH}_3)_2)$
$[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_2\text{Cl}_5(\text{OH})_2$	$\text{H}_2\text{B}_{12}\text{H}_2\text{Cl}_5(\text{OH})_2$
$\text{Cs}_2\text{B}_{12}\text{H}_{10}(\text{SO}_2\text{C}_6\text{H}_5)_2$	$\text{H}_2\text{B}_{12}\text{H}_{10}(\text{SO}_2\text{C}_6\text{H}_5)_2$
$\text{Cs}_2\text{B}_{12}\text{H}_{10}(\text{CH}(\text{CH}_3)_2)_2$	$\text{H}_2\text{B}_{12}\text{H}_{10}(\text{CH}(\text{CH}_3)_2)_2$

Compounds of Formula 1 where M is an alkali or alkaline earth metal, e.g., Na, K, Cs, Ca, Ba, Mg, and Sr, can undergo simple metathetic reactions with other salts to effect an exchange of cations. Thus, $\text{Na}_2\text{B}_{12}\text{H}_{10}\text{Cl}_2$ or $\text{K}_2\text{B}_{12}\text{H}_{11}(\text{OH})_4$ can be reacted in aqueous solution with ammonium sulfate, benzenediazonium hydroxide, pyridinium chloride, morpholinium sulfate, polyethylenimine hydrochloride, and the like, to form compounds of Formula 1 having ammonium, benzenediazonium,

pyridinium, morpholinium, and the like, as cations. These illustrations are not limiting and they demonstrate the breadth of metathetic reactions which can be used.

Compounds of the invention in which the group M is a metal, particularly a transition metal, or a Werner-type complex, frequently contain solvent of crystallization when isolated by conventional methods. The solvent, e.g., water, can be bound loosely in the lattices of the crystals or it can be associated by stronger bonds with the metal cation or Werner-type complex cation. Solvent of crystallization, entrapped in crystal lattices, is removed easily by well-known procedures, e.g., heating under reduced pressure. Solvent of crystallization which is associated with the cation is more difficult to remove, and for most applications, it is not necessary to remove completely this type of bound solvent.

The products of the invention and processes for obtaining them are illustrated in the following examples.

Preparations of representative dodecahydrododecaborates, and a bis(carbonyl) dodecaborane (10), are illustrated in Examples A, B, C, D and E. The products as obtained, are used as reactants to prepare the compounds of the invention.

EXAMPLE A

A pressure vessel of 400 ml. capacity is charged with 9.5 g. of sodium hydroborate and 75 ml. of 1,2-dimethoxyethane, also called "glyme." The vessel is closed, cooled to -80°C . and evacuated to a pressure of about 0.001 mm. of mercury. Diborane (14.0 g.) is charged into the vessel which is then sealed and heated with agitation under autogenous pressure for 10 hours at 120°C . The molar ratio of NaBH_4 to B_2H_6 in this reaction is 1:2. The reactor is cooled, the volatile products are released by venting and the contents of the tube are washed into a receiver with glyme. A suspension of a white solid in a yellow liquid is formed from which the solid is separated by filtration. The solid is dissolved in hot tetrahydrofuran and the solution if filtered to remove a trace of unreacted sodium hydroborate. The hot filtrate is diluted with glyme and chilled to yield 14.0 g. of disodium polyhydrododecaborate (2^-) as long, glistening white needles. The compound crystallizes with 1,2-dimethoxyethane and water. The compound has the following infrared absorption frequencies: 2.8μ , sharp, medium; 3.9μ with 4.02μ shoulder, sharp, strong; 6.2 , 7.8 and 8.4μ sharp, medium; 9.3μ , medium, sharp, strong; 10.9μ sharp, strong; and 13.9μ , broad, weak. The compound shows the absorption bands which are characteristic of the dodecahydrododecaborate anion. It has the following elemental analysis: Analysis found—C, 14.33; H, 7.09; B, 45.08; Na, 16.1.

The compound therefore is a solvate of disodium dodecahydrododecaborate having the following composition: $\text{Na}_2\text{B}_{12}\text{H}_{12} \cdot 0.86\text{C}_4\text{H}_{10}\text{O}_2 \cdot 1.25\text{H}_2\text{O}$.

The compound can be obtained as its hydrate, free of ether of solvation, by recrystallization from a large quantity of diethyl ether or tetrahydrofuran/diethyl ether mixtures, followed by drying under reduced pressure. The ether-free hydrate has infrared absorption characteristics as follows: 2.8μ , sharp, medium; 3.9μ , sharp, strong; 6.2μ , sharp, medium; 9.25μ , sharp, medium; and 13.9μ , broad, medium. The elemental analysis is as follows: Found—H, 6.56; B, 62.02; Na, 20.5.

The compound is therefore a monohydrate of disodium dodecahydrododecaborate, i.e., $\text{Na}_2\text{B}_{12}\text{H}_{12} \cdot \text{H}_2\text{O}$ (calculated analysis: H, 6.85; B, 63.05; Na, 22.32).

The dihydrate, $\text{Na}_2\text{B}_{12}\text{H}_{12} \cdot 2\text{H}_2\text{O}$, is obtained in the above process by less intensive drying of the crystals.

EXAMPLE B

An aqueous solution of 3.2 g. of $\text{Na}_2\text{B}_{12}\text{H}_{12}$ (with water and 1,2-dimethoxyethane as solvents of crystallization), obtained as described in Example A, is mixed with an aqueous solution of 12 g. of cesium fluoride. A heavy white precipitate forms which dissolves in the reaction mixture on warming. On cooling, fine white crystals form which are separated by filtration and dried. There is obtained 3.2 g. of cesium dodecahydrododecaborate(2^-) with 1,2-dimethoxyethane as solvent of crystallization.

EXAMPLE C

An aqueous solution containing 0.43 g. of the hydrate of disodium dodecahydrododecaborate(2^-) is passed through a $0.5''$ diameter chromatography column containing 80 ml. of the ion-exchange resin of the cross-linked polystyrene-sulfonic acid type. The strongly acid effluent from the column is evaporated to remove all materials volatile at less than 0.001 mm. at 45°C . There remains 0.38 g. of a very white, crystalline, very hygroscopic solid which is a hydrate of

dihydrogen dodecahydrododecaborate(2⁻). The acid titrates as a very strong acid, having an equivalence point at a pH of 7. The infrared absorption spectrum of the acid, which has the formula $\text{H}_2\text{B}_{12}\text{H}_{12}$, shows strong absorption at 3.98μ and 9.3μ . The crystalline acid, as normally obtained, contains from 2 to 10 or more moles of water of hydration. Two moles of water of hydration are considered to be associated with the hydrogen ions and the various hydrates can, therefore, be written as $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_{12}$, $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_{12} \cdot 8\text{H}_2\text{O}$, and the like.

EXAMPLE D

(A) An aqueous solution containing 0.3 g. of the hydrate of disodium dodecahydrododecaborate is mixed with an aqueous solution containing an equal weight of tetramethylammonium chloride. A white precipitate forms immediately. The mixture is heated to boiling and sufficient methanol is added to form a clear solution. The solution is chilled and white crystals form which are separated by filtration, washed and dried at very low pressure at 90°C . There is obtained 0.14 g. of bis(tetramethylammonium) dodecahydrododecaborate(2⁻). The compound can be purified by recrystallization from water.

The infrared absorption spectrum of the compound is as follows, using a Nujol mull: 3.95μ , sharp, strong; fine structure at 4.9 – 6.5μ , weak; 7.8μ , sharp, medium; 9.4μ , sharp, strong; and [for the $(\text{CH}_3)_4\text{N}^+$ cation], 10.5μ , sharp, strong.

(B) An aqueous solution of the free acid ($\text{H}_2\text{B}_{12}\text{H}_{12}$) obtained from $\text{Na}_2\text{B}_{12}\text{H}_{12}$ is neutralized by treatment with cesium hydroxide. A white solid precipitates which is separated by filtration and dried as described above. The product, which is $\text{Cs}_2\text{B}_{12}\text{H}_{12}$, is sparingly soluble in water and it is characterized by the following infrared absorption bands: 3.9μ , 9.35μ , sharp, strong; 14.0μ , sharp, medium; 13.3μ , medium broad, weak.

(C) An aqueous solution of $\text{H}_2\text{B}_{12}\text{H}_{12}$, obtained from $\text{Na}_2\text{B}_{12}\text{H}_{12}$, is stirred with an excess of nickelous carbonate (NiCO_3) until no further solution of the carbonate is observed. The excess reagent is removed by filtration and the filtrate is evaporated by gentle warming at 25 mm. pressure. The residual solid is dried at about 25°C . and at a final pressure of 25 microns. There is obtained a pale green, very water-soluble hydrated nickel dodecahydrododecaborate (2⁻).

Analysis.—Calc'd for $\text{NiB}_{12}\text{H}_{12} \cdot 6\frac{1}{2}\text{H}_2\text{O}$ (percent): Ni, 18.74; B, 41.45; H, 7.88. Found (percent): Ni, 18.72, 18.68; B, 41.18, 41.44; H, 8.05, 9.01.

(D) An aqueous solution of $\text{H}_2\text{B}_{12}\text{H}_{12}$ is neutralized with an aqueous solution of KOH. The solution is evaporated to dryness under reduced pressure to obtain a hydrate of $\text{K}_2\text{B}_{12}\text{H}_{12}$ as a solid crystalline product. The degree of hydration is not critical and the compound is employed in reactions as obtained above.

EXAMPLE E

Preparation of $\text{B}_{12}\text{H}_{10} \cdot 2\text{CO}$

A silver-lined shaker tube (capacity, 400 ml.) is charged with 20 g. of a hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$ containing 4–6 moles of water per mole of acid. The tube is sealed and evacuated to a low pressure. The tube is attached to a shaker, heated cautiously and carbon monoxide is admitted under pressure in several stages until a temperature of 80°C . and a pressure of 1000 atmospheres is reached. The tube is shaken for 5 hours at 80°C . and 975–1000 atmospheres with repressuring with CO as necessary. At the end of this time the tube is cooled to atmospheric temperature (ca. 25°C .) and it is vented to remove unreacted carbon monoxide.

A portion of the semisolid reaction product is dried under reduced pressure in a sublimation apparatus and the dried material is heated at 100°C . $\text{C}/1\text{ mm. Hg}$ pressure. The compound $\text{B}_{12}\text{H}_{10} \cdot 2\text{CO}$, which can also be written as $\text{B}_{12}\text{H}_{10}(\text{CO})_2$, is collected as a crystalline sublimate.

Analysis.—Calc'd for $\text{B}_{12}\text{H}_{10} \cdot 2\text{CO}$ (percent): C, 12.2; H, 5.1; 66.1. Found (percent): C, 13.0; H, 5.5; B, 65.4.

A second portion of the product from the shaker tube is dried at $25^\circ\text{C}/1\text{mm. Hg}$ pressure in the presence of P_2O_5 and extracted with hot benzene. The benzene extract is cooled and $\text{B}_{12}\text{H}_{10} \cdot 2\text{CO}$ precipitates as a crystalline solid. It is separated by filtration and dried.

The infrared absorption spectrum of the compound in a mineral oil mull shows strong bands at 3.9μ and 4.55μ ; somewhat weaker bands at 9.3μ and 13.8μ ; and weaker bands at 9.1μ , 9.8μ , 11.7μ and 13.5μ .

The procedures described in Example D are generic for the preparation of salts of the $\text{B}_{12}\text{H}_{12}^{2-}$ anion. The procedures described in Parts B and C are particularly

useful, employing as one reactant, a base with the desired cation, i.e., group M, to neutralize the acid $\text{H}_2\text{B}_{12}\text{H}_{12}$. The solution can be evaporated to dryness in the event the salt is soluble and does not precipitate. Any salt which is desired for use as a reactant in substitution reactions can, therefore, be prepared by the above process.

The compounds of the invention are further illustrated by reference to the following examples:

EXAMPLE 1

(A) A corrosion-resistant reaction vessel is charged with 1 g. of $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OH}$, prepared as described in Example 8, Part A. The vessel is cooled to 0°C . and 15 ml. of anhydrous HF is added. The mixture is agitated for 1 hour at 0°C . and it is then warmed to about 25°C . to volatilize unreacted HF. The solid crystalline product which remains is principally $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{F}$. It contains 5.98% fluorine and the infrared spectrum shows substantially no absorption bands for the hydroxyl group.

(B) A corrosion-resistant pressure vessel is cooled in solid carbon dioxide and it is flushed with nitrogen. The vessel is charged with 25 g. of anhydrous HF and 5.0 g. of hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$. It is closed and the mixture is heated with agitation under autogenous pressure for 4 hours at $85\text{--}100^\circ\text{C}$. The mixture is cooled to about 25°C ., vented into a corrosion-resistant container, and flushed with nitrogen to remove all unreacted hydrogen fluoride. The residue is removed and it is neutralized with aqueous 50% cesium hydroxide solution. The precipitate is separated by filtration and it is crystallized from water to obtain a white crystalline product which is a mixture of about 80% $\text{Cs}_2\text{B}_{12}\text{H}_8\text{F}_4$ and 20% $\text{Cs}_2\text{B}_{12}\text{H}_7\text{F}_5$.

Analysis.—Calc'd for the above mixture (percent): B, 25.1; F, 16.5. Found (percent): B, 25.1, 25.0; F, 16.5, 16.3.

The process is repeated, using twice the quantities given above. There is obtained a white crystalline solid which is a mixture of about 30% $\text{Cs}_2\text{B}_{12}\text{H}_8\text{F}_3$ and 70% $\text{Cs}_2\text{B}_{12}\text{H}_8\text{F}_4$.

Analysis.—Calc'd for the above mixture (percent): F, 14.8. Found (percent): F, 14.87.

(C) The process of Part B is repeated again and there is obtained in pure form the tetrafluoro derivative.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_8\text{F}_4$ (percent): B, 27.0; F, 15.7. Found (percent): B, 27.0; F, 15.7.

(D) A mixture of 10 g. of the monohydrate of $\text{Na}_2\text{B}_{12}\text{H}_{12}$ and 40 g. of anhydrous HF is heated in a corrosion-resistant pressure vessel at 90°C . for 5 hours under autogenous pressure. The vessel is cooled, vented and nitrogen gas is bubbled through it vigorously for 4 hours at about 25°C . to remove unreacted HF. The residual reaction mixture is removed and it is neutralized with aqueous 50% CsOH solution. The cesium salt which precipitates is separated and recrystallized three times from water to obtain 16 g. of a mixture of about 80% $\text{Cs}_2\text{B}_{12}\text{H}_8\text{F}_4$ and 20% $\text{Cs}_2\text{B}_{12}\text{H}_7\text{F}_5$.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{7.8}\text{F}_{4.2}$ (percent): B, 25.1; F, 16.5; Cs, 55.0. Found (percent): B, 24.34; F, 16.4; Cs, 57.5.

(E) The process of Part D is repeated except that the temperature of the reaction is increased to 150°C . The compound obtained is $\text{Cs}_2\text{B}_{12}\text{H}_6\text{F}_6$. The infrared spectrum of the compound shows absorption at the following wavelengths: 4.0, 8.5 (strong), 9.4 (weak), 10.2 (strong), 10.7, 11.6, 12.1 and 13.8μ .

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_6\text{F}_6$ (percent): B, 25.0; F, 22.1. Found (percent): B, 24.3; F, 21.6.

(F) Anhydrous $\text{K}_2\text{B}_{12}\text{H}_{12}$ and HF are reacted at 150°C . under the conditions described for Part D. The product, isolated as the cesium salt, is the pentafluoro derivative.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_7\text{F}_5$ (percent): B, 25.9; F, 19.1. Found (percent): B, 25.3; F, 18.6.

(G) The process of Part D is repeated employing 21.5 g. of $\text{Na}_2\text{B}_{12}\text{H}_{12}\cdot 6\text{H}_2\text{O}$ and 30 g. of anhydrous HF. The mixture is heated 5 hours at 90°C . The product isolated as the cesium salt, is a mixture of $\text{Cs}_2\text{B}_{12}\text{H}_{10}\text{F}_2$ and $\text{Cs}_2\text{B}_{12}\text{H}_9\text{F}_3$. The analysis is as follows: F, 10.33%; B, 25.21%.

(H) A reaction vessel is charged with 40 ml. of water and 2.5 g. of hydrated $\text{NiB}_{12}\text{H}_{12}$, prepared as described in Example D, Part C. A stream of gas containing one part fluorine to ten parts of nitrogen is passed into the reaction mixture for 7 hours. Passage of the gas mixture is stopped and the reaction mixture is neutralized with NH_4OH . Incipient precipitation of $\text{Ni}(\text{NH}_4)_3\text{B}_{12}\text{H}_{11}\text{OH}$ occurs. At this point

addition of NH_4OH is stopped and the solution is filtered. Traces of the BF_4^- ion are removed as the cesium and rubidium salts and the solution which remains is mixed with $(\text{CH}_3)_4\text{NCl}$ to precipitate tetramethylammonium cesium undecafluorohydroxydodecaborate(2^-). The infrared spectrum shows absorption bands as follows (expressed as cm^{-1}): 1215, strong; 725, strong, broad; 1080, 770 and 705, weak. Absorption bands, characteristic of the B—H bonding, are absent.

Analysis.—Calc'd for $(\text{CH}_3)_4\text{NCsB}_{12}\text{F}_{11}\text{OH}$ (percent): C, 8.53; H, 2.31; B, 23.0; F, 37.1. Found (percent): C, 8.72; H, 2.33; B, 22.5; F, 35.6.

(I) A reaction vessel of poly(tetrafluoroethylene) resin is charged with 200 ml. of water and 8.8 g. of crystalline hydrated $\text{K}_2\text{B}_{12}\text{H}_{12}$. The mixture is stirred to form a solution and it is cooled to about 0°C . Fluorine diluted with nitrogen (about 5 parts nitrogen to 1 part fluorine) is bubbled into the solution at a rate of 90 ml./min. for 50 hours. The temperature is maintained at about 0°C . during the operation. Flow of fluorine is stopped and the reaction mixture is filtered. The filtrate is evaporated in a platinum vessel at $90\text{--}100^\circ\text{C}$. (steam bath temperatures) to obtain 11.9 g. of a viscous mass which solidifies on cooling. The mass is neutralized with 8 ml. of 7 N aqueous KOH and the mixture is filtered. An aqueous solution of 6 g. of CsF in 6 ml. of water is added to the filtrate with stirring to precipitate $\text{Cs}_2\text{B}_{12}\text{F}_{11}\text{OH}$. The precipitate is separated by filtration and the filtrate is partially concentrated to obtain an additional quantity of product. Total yield of $\text{Cs}_2\text{B}_{12}\text{F}_{11}\text{OH}$ is 9.8 g. The product is recrystallized three times from slightly more than its weight in water and dried under reduced pressure at 100°C . The infrared spectrum of the compounds shows a band at $2.71\text{--}2.73\mu$ (doublet).

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{F}_{11}\text{OH}$ (percent): Cs, 42.8; B, 20.9; F, 33.6. Found (percent): Cs, 42.4; B, 21.3; F, 33.5.

EXAMPLE 2

(A) A corrosion-resistant pressure vessel is cooled in solid carbon dioxide and flushed with nitrogen gas. It is charged with 20 g. of anhydrous HCl and 11 g. of hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ prepared as described in Example C. The vessel is closed and the mixture is heated with agitation for 4 hours at 85°C . The vessel and contents are cooled to about 25°C . and volatile products are removed by venting. These products include unreacted HCl . The crude product remaining in the vessel is removed by washing with ice water and the aqueous solution is neutralized with aqueous $(\text{CH}_3)_4\text{NOH}$. The solid which forms is separated by filtration and it is purified by recrystallization from water. The compound is bis(tetramethylammonium) monochloroundecafluorododecaborate(2^-). It is a white, crystalline product whose infrared spectrum, taken in a Nujol mull, shows absorption at the following wavelengths (express as microns, exclusive of bands coincident with Nujol): strong at 4.0, 9.6, 10.6 and 12.0; weaker at 7.8 and 12.4. The identity of the compound is confirmed by elemental analyses.

Analysis.—Calc'd for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{11}\text{Cl}$ (percent): N, 8.6; Cl, 11.1. Found (percent): N, 8.22; Cl, 11.56.

(B) A mixture of 5.0 g. of $\text{NaB}_{12}\text{H}_{12} \cdot \text{H}_2\text{O}$ and 36.5 g. of anhydrous HCl is heated in a pressure vessel with agitation at 90°C . for 5 hours under autogenous pressure. The reaction mixture is processed as described in Example 1, Part D, for the preparation of the fluorinated derivative, except that $(\text{CH}_3)_4\text{NOH}$ is employed in place of CsOH . The product obtained is $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{11}\text{Cl}$. Elemental analyses are as follows: N, 7.4; Cl, 11.8.

(C) A reaction vessel is charged with 100 ml. of water and 10 g. of the hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$. The mixture is cooled to about 0°C . and chlorine gas is bubbled through the solution until the color of chlorine persists. Passage of gas is stopped, the solution is evaporated to a small volume and it is neutralized with NH_4OH . An aqueous solution of $(\text{CH}_3)_4\text{NCl}$ is added to the neutral solution and the precipitate which forms is separated by filtration. The compound, which is bis(tetramethylammonium) hexachlorohexafluorododecaborate(2^-), is purified by crystallization from water. It is a white crystalline solid which, in a Nujol mull, shows the following principal characterizing absorption bands in the infrared spectrum (expressed as cm^{-1}): 1060, strong; 1025, shoulder; 950, strong; 885, strong; 850–790, strong, broad; 715, strong, broad.

Analysis.—Calc'd for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_6\text{Cl}_6$ (percent): H, 6.1; C, 19.25; B, 26.1; Cl, 42.7. Found (percent): H, 5.70; C, 18.60; B, 25.7; Cl, 43.16.

(D) A reaction vessel is charged with 100 ml. of water and 1.9 g. of $\text{Cs}_2\text{B}_{12}\text{H}_{12} \cdot \text{C}_4\text{H}_{10}\text{O}_2$, prepared as described in Example B. Chlorine gas is passed into the solution at prevailing atmospheric temperature (about 25°C .) until the solution is saturated and passage of chlorine is continued for 2.5 hours. The

resulting clear solution is evaporated under reduced pressure to obtain a white crystalline solid as a residue. The infrared absorption spectrum of the product shows that it is free of solvent, i.e., no dimethoxyethane (glyme) is present. The infrared spectrum further shows strong absorption at 9.5μ and at 11.7μ .

The solid is recrystallized from aqueous solution to give fine white crystals whose infrared absorption spectrum shows a greatly reduced B—H absorption band at 4.0μ . The compound is again crystallized from water and the fine white crystals are dried at 65°C . at 0.02 mm. pressure for 3 hours. Elemental analysis of the product and the infrared absorption spectrum show that the compound is dicesium dodecachlorodihydrododecaborate(2^-), i.e., $\text{Cs}_2\text{B}_{12}\text{H}_2\text{Cl}_{10}$.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_2\text{Cl}_{10}$ (percent): Cs, 35.4; B, 17.3; Cl, 47.2. Found (percent): Cs, 35.6; B, 17.69; Cl, 45.15.

(E) A glass reaction vessel is charged with 40 g. of $\text{Na}_2\text{B}_{12}\text{H}_{12}\cdot 2\text{H}_2\text{O}$ and 320 ml. of water. The mixture is stirred, cooled to $13\text{--}20^\circ\text{C}$. and chlorine gas is passed into it at this temperature for 2–3 hours. The cooling bath is removed and passage of chlorine gas is continued for 2 hours at $20\text{--}63^\circ\text{C}$. The mixture is now warmed to steam bath temperature and chlorine gas is passed through it for 2 hours. An aliquot portion of the reaction mixture is removed and mixed with an aqueous solution of $(\text{CH}_3)_4\text{NCl}$. The precipitate which forms is separated and it is crystallized from water to obtain $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_2\text{Cl}_{10}$. The infrared absorption spectrum shows characterizing absorption bands at 4.0μ (weak), $9.4\text{--}9.8\mu$ (strong), and 11.4μ (strong).

(F) The solution remaining from the reaction of Part E is divided into two equal parts. Each portion is charged into a silver-lined pressure vessel (400 ml. capacity) and 50 g. of chlorine is added to each vessel. The reaction mixtures are heated for 2 hours at 150°C . under autogenous pressure. The vessels are cooled and vented to remove volatile products. The residual liquids are filtered and the combined filtrates are subjected to low pressure (water pump vacuum) to remove dissolved chlorine. The liquid is neutralized with about 120 ml. of 10 N potassium hydroxide and it is filtered again. A concentrated aqueous cesium fluoride solution is added to the filtrate with stirring. The precipitate which forms is separated by filtration to obtain $\text{Cs}_2\text{B}_{12}\text{Cl}_{12}$ as a white crystalline solid. The compound is crystallized from about 2.8 parts of hot water to obtain 117.5 g. of product, i.e., dicesium dodecachlorododecaborate(2^-) as the monohydrate.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{Cl}_{12}\cdot\text{H}_2\text{O}$ (percent): Cs, 31.68; B, 15.47; Cl, 50.70. Found (percent): Cs, 31.20; B, 15.58; Cl, 50.42.

(G) A reaction vessel is charged with 120 ml. of water and 20 g. of the monohydrate of $\text{Na}_2\text{B}_{12}\text{H}_{12}$. The solution is cooled in a mixture of ice and water and chlorine gas is bubbled through the solution until no further absorption of chlorine is evident. The solution is warmed to about 30°C . and passage of chlorine gas is continued until no further uptake of chlorine occurs. The reaction mixture and 50 g. of chlorine is now charged into a corrosion-resistant pressure vessel and the mixture is heated under autogenous pressure at 150°C . for 2 hours. The vessel is cooled, vented to the air and the reaction mixture is washed out with water. Some corrosion of the reaction vessel occurs and the mixture contains iron and other heavy metals as salts. The solution is neutralized with NH_4OH and the precipitated metal hydroxides are separated by filtration. The filtrate is divided into three equal parts which are treated as follows:

(1) Aqueous CsF solution is added to one part and the white precipitate which forms is separated. The precipitate is crystallized several times from hot water to yield pure dicesium dodecachlorododecaborate(2^-). This salt is moderately soluble in water. The infrared absorption spectrum of a Nujol mull of the compound shows the following bands (expressed as cm^{-1}): 1040, very strong; 1005, weak; 725, weak, broad.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{Cl}_{12}$ (percent): Cs, 32.4; B, 15.7; Cl, 51.8. Found (percent): Cs 30.2; B, 15.8; Cl, 51.2.

(2) A second part is mixed with an aqueous solution of RbCl and the white precipitate, which is dirubidium dodecachlorododecaborate(2^-), is separated by filtration. The salt is very water-soluble and it is purified by crystallization from water. The infrared absorption spectrum of a Nujol mull of the compound shows the following bands (expressed as cm^{-1}): 1050, very strong; 1005, weak; 950 and 970, very weak; 890, very weak; 725, weak, broad.

Analysis.—Calc'd for $\text{Rb}_2\text{B}_{12}\text{Cl}_{12}$ (percent): B, 17.7; Cl, 58.7. Found (percent): B, 18.1; Cl, 59.7.

(3) The third part is mixed with an aqueous solution of $(\text{CH}_3)_4\text{NCl}$. The precipitate is treated as described above to obtain bis(tetramethylammonium)

dodecachlorododecaborate(2-) as a white, crystalline product which has very low solubility in water. The infrared absorption spectrum of a Nujol mull of the compound shows the following bands (expressed as cm^{-1}): 1040, very strong; 1005, weak; 950, strong; 725 weak, broad.

Analysis.—Calc'd for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Cl}_{12}$ (percent): C, 13.9; H, 3.48; N, 4.03; B, 18.8; Cl, 61.2. Found (percent): C, 13.9; H, 3.97; N, 4.07; B, 18.1; Cl, 61.1.

The above compound is crystallized from solution in aqueous 1,2-dimethoxyethane to yield the monoetherate.

Analysis.—Calc'd for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Cl}_{12} \cdot \text{CH}_3\text{OC}_2\text{H}_4\text{OCH}_3$ (percent): C, 18.2; H, 4.60; B, 16.6; Cl, 53.6. Found (percent): C, 18.0; H, 4.35; B, 16.2; Cl, 52.5.

(H) A portion of the product $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Cl}_{12}$, obtained in Part G, is dissolved in water and the aqueous solution is passed through a column packed with an acidic ion-exchange resin. The eluate is evaporated under reduced pressure at 25° C. to obtain the hydrate of the free acid, $\text{H}_2\text{B}_{12}\text{Cl}_{12}$, as a crystalline hygroscopic white solid.

Analysis.—Calc'd for $(\text{H}_3\text{O})_2\text{B}_{12}\text{Cl}_{12} \cdot 6\text{H}_2\text{O}$ (percent): B, 18.5; Cl, 60.6; N.E., 350.8. Found (percent): B, 18.0; Cl, 59.9; N.E., 342.

A solution of 80 g. of $\text{Cs}_2\text{B}_{12}\text{Cl}_{12} \cdot \text{H}_2\text{O}$, obtained as described in Part F, is dissolved in 800 ml. of water and the warm solution is passed through a column, containing 753.5 g. of an acidic ion-exchange resin. The eluate is evaporated under reduced pressure to obtain $\text{H}_2\text{B}_{12}\text{Cl}_{12}$ containing 7.5 moles of water.

Analysis.—Calc'd for $(\text{H}_3\text{O})_2\text{B}_{12}\text{Cl}_{12} \cdot 5\frac{1}{2}\text{H}_2\text{O}$ (percent): B, 18.75; Cl, 61.44. Found (percent): B, 18.73; Cl, 61.10.

The above hydrated acid is further dried under reduced pressure at 100° C. over P_2O_5 in an Abderholden unit for 22 hours to remove 5 moles of water of hydration.

Analysis.—Calc'd for $(\text{H}_3\text{O})_2\text{B}_{12}\text{Cl}_{12} \cdot \frac{1}{2}\text{H}_2\text{O}$ (percent): B, 21.56; Cl, 70.63. Found (percent): B, 21.19; Cl, 70.99.

The infrared absorption spectrum of a Nujol mull of each of the above acidic compounds shows strong absorption at 9.7μ with a "sharp" shoulder at 10.0μ and no absorption at 4.0μ .

(I) An aqueous 0.086 M solution of $\text{H}_2\text{B}_{12}\text{Cl}_{12}$, prepared as described in Part H, is neutralized to a pH value of 7 with 1 N sodium hydroxide solution. The solution is evaporated under reduced pressure at 25° C. to obtain the disodium salt as a white crystalline solid.

Analysis.—Calc'd for $\text{Na}_2\text{B}_{12}\text{Cl}_{12} \cdot 2\frac{1}{2}\text{H}_2\text{O}$ (percent): Na, 7.11; B, 20.09; Cl, 65.83. Found (percent): Na, 7.60; B, 19.60; Cl, 65.97.

(J) An aqueous 0.086 M solution of $\text{H}_2\text{B}_{12}\text{Cl}_{12}$, prepared as described in Part H, is stirred about 18 hours with excess nickel carbonate. The solution is filtered to remove unreacted nickel carbonate and the filtrate is processed as described in Part I. The nickel salt is obtained as a pale green crystalline solid.

Analysis.—Calc'd for $\text{NiB}_{12}\text{Cl}_{12} \cdot 8\text{H}_2\text{O}$ (percent): Ni, 7.74; B, 17.13; Cl, 56.12. Found (percent): Ni, 7.81; 7.85; B, 16.82; Cl, 58.32.

The above salt is dried under reduced pressure over P_2O_5 at 100° C. for 31 hours to obtain the nickel salt as a tetrahydrate, a yellow crystalline product which dissolves readily in water.

Analysis.—Calc'd for $\text{NiB}_{12}\text{Cl}_{12} \cdot 4\text{H}_2\text{O}$ (percent): Ni, 8.55; B, 18.93; Cl, 62.02; H_2O , 10.50. Found (percent): Ni, 8.55; 8.45; B, 18.89; Cl, 62.81; H_2O , 9.72, 9.67.

The nickel salt is further dried 42 hours at 148° C. in the manner described above to obtain $\text{NiB}_{12}\text{Cl}_{12} \cdot 2\text{H}_2\text{O}$. Continued drying at 207.5° C. under reduced pressure yields the anhydrous salt, $\text{NiB}_{12}\text{Cl}_{12}$.

(K) An aqueous 0.086 M solution of $\text{H}_2\text{B}_{12}\text{Cl}_{12}$ is swirled with Ag_2O until reaction is complete. The mixture is filtered and the filtrate is evaporated under reduced pressure at 25° C. to obtain the silver salt. The product is white and water-soluble.

Analysis.—Calc'd for $\text{Ag}_2\text{B}_{12}\text{Cl}_{12}$ (percent): Ag, 27.98; Cl, 55.18; B, 16.84. Found (percent): Ag, 27.72; Cl, 54.61; B, 16.51.

(L) An aqueous solution of the silver salt of Part K is mixed with NH_4OH . The white precipitate which forms is separated to obtain $[\text{Ag}(\text{NH}_3)_2]_2\text{B}_{12}\text{Cl}_{12}$ as a crystalline solid.

(M) Excess cerium carbonate is stirred overnight with an aqueous solution of $\text{H}_2\text{B}_{12}\text{Cl}_{12}$ (0.0841 mole). The solution is filtered and the filtrate is evaporated under reduced pressure at less than 50° C. to obtain hydrated $\text{Ce}_2(\text{B}_{12}\text{Cl}_{12})_3$ as a colorless, water-soluble salt.

Analysis.—Calc'd for $\text{Ce}_2(\text{B}_{12}\text{Cl}_{12})_3 \cdot 22\text{H}_2\text{O}$ (percent): Ce, 12.0; B, 16.7; Cl, 54.5. Found (percent): Ce, 11.0; B, 18.7; Cl, 54.8.

(N) An aqueous solution of $\text{H}_2\text{B}_{12}\text{Cl}_{12}$ (0.1035 mole) is stirred overnight with excess europium oxide. The reaction mixture is filtered and the filtrate is evaporated in a rotary drier under reduced pressure at less than 40°C . It is further dried under reduced pressure at about 25°C . over P_2O_5 to obtain a hydrate of $\text{Eu}_2(\text{B}_{12}\text{Cl}_{12})_3$ as a yellow-green solid.

Analysis.—Calc'd for $\text{Eu}_2(\text{B}_{12}\text{Cl}_{12})_3 \cdot 18\text{H}_2\text{O}$ (percent): Eu, 13.3; Cl, 55.6. Found (percent): Eu, 14.0; Cl, 55.9.

EXAMPLE 3

(A) A mixture consisting of 9 g. of hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ (crystalline) and 36 g. of anhydrous HBr is heated in a corrosion-resistant pressure vessel under autogenous pressure for 4 hours at $100\text{--}105^\circ\text{C}$. The reaction vessel is cooled, vented and the reaction mixture is neutralized with $(\text{CH}_3)_4\text{NOH}$. The solid product is separated and recrystallized twice from water to obtain a compound which is principally the acid salt, $(\text{CH}_3)_4\text{NHB}_{12}\text{H}_{11}\text{Br}$.

Analysis.—Calc'd for $(\text{CH}_3)_4\text{NHB}_{12}\text{H}_{11}\text{Br}$ (percent): C, 16.3; H, 8.2; Br, 27.0. Found (percent): C, 19.9; H, 8.4; Br, 25.4.

The tetramethylammonium acid salt, obtained above, is dissolved in water and the solution is passed through a column filled with a sodium ion-exchange resin. The aqueous effluent is a solution of $\text{Na}_2\text{B}_{12}\text{H}_{11}\text{Br}$. Sufficient CsOH is added to the effluent to precipitate the compound as the cesium salt. It is separated, washed and crystallized twice from water to obtain the cesium salt as a dihydrate.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{Br} \cdot 2\text{H}_2\text{O}$ (percent): B, 24.9; Br, 15.3. Found (percent): B, 24.2; Br, 14.0.

(B) A solution of 8.4 g. of an etherate (glyme) of disodium dodecahydrododecaborate(2^-) in aqueous methanol is chilled to $0\text{--}10^\circ\text{C}$. Bromine is added dropwise until it is no longer rapidly absorbed. Approximately 6.5 ml. of bromine is used. Bromine addition is continued until a total of 8.5 ml. is used. A small amount of solid forms and it is separated by filtration and discarded. The filtrate is evaporated to dryness at 10 mm. and 80°C . to leave a white solid suspended in an oil. This residue is taken up in a little water, made alkaline with sodium hydroxide and evaporated again to dryness at 10 mm. and 80°C . to leave a white solid. This residue is extracted with warm tetrahydrofuran. The insoluble portion, sodium bromide, is discarded. The tetrahydrofuran solution, clarified by filtration, is diluted with dioxane to precipitate white solid disodium hexabromohexahydrododecaborate(2^-) which is washed with dioxane and dried.

Analysis.—Calc'd for $\text{Na}_2\text{B}_{12}\text{H}_6\text{Br}_6 \cdot 10\text{C}_4\text{H}_8\text{O}_2 \cdot 2\text{H}_2\text{O}$ (percent): C, 16.17; H, 3.53; B, 13.15; Na, 4.66; Br, 48.56. Found (percent): C, 16.61; H, 3.86; B, 13.43; Na, 4.3; Br, 47.56.

(C) A solution is prepared consisting of 200 ml. of 50% aqueous methanol and 22 g. of $\text{Na}_2\text{B}_{12}\text{H}_{12} \cdot 2\text{H}_2\text{O}$. The solution is cooled to about 5°C . and it is brominated as described in Part B, employing 32.2 ml. of liquid bromine. The reaction mixture is processed as described in Part B to obtain a solution of $\text{Na}_2\text{B}_{12}\text{H}_6\text{Br}_6$ in tetrahydrofuran. The solution is evaporated to dryness, leaving 91 g. of a syrup-like residue which contains tetrahydrofuran as solvent of crystallization. The residue is dissolved in 250 ml. of water and the solution is evaporated to dryness to remove the tetrahydrofuran. The residue solidifies at prevailing atmospheric temperature to yield the sodium salt containing about 6 moles of water of hydration, i.e. $\text{Na}_2\text{B}_{12}\text{H}_6\text{Br}_6 \cdot 6\text{H}_2\text{O}$.

(D) An aqueous methanolic solution containing 0.25 g. of disodium dodecahydrododecaborate(2^-) is cooled to 0°C . and liquid bromine is added dropwise with vigorous stirring until the color of bromine persists in the solution. Aqueous tetramethylammonium chloride is added with stirring to the solution and the white solid which forms is separated by filtration. It is recrystallized from aqueous methanol to obtain 0.32 g. of product in the first crop. A second crop of 0.23 g. of crystals is obtained from the filtrate. The crystals are a mixture of bis(tetramethylammonium) hexabromohexahydrododecaborate(2^-), i.e., $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_6\text{Br}_6$, and bis(tetramethylammonium) pentabromoheptahydrododecaborate(2^-), i.e., $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_7\text{Br}_5$.

Elemental analyses of the two crops of crystals are as follows:

First crop

Analysis.—Calc'd for $(\text{C}_4\text{H}_{12}\text{N})_2\text{B}_{12}\text{H}_{6.5}\text{Br}_{5.5}$ (percent): C, 13.26; H, 4.24; B, 17.92; N, 3.87; Br, 60.66. Found (percent): C, 14.14; B, 4.55; B, 17.69; N, 3.83; Br, 59.65.

Second crop

Analysis.—Calc'd for $(C_4H_{12}N)_2B_{12}H_6Br_6 \cdot 6H_2O$ (percent): C, 13.12; H, 4.19; B, 17.73; N, 3.83; Br, 61.13. Found (percent): C, 12.69; H, 3.98; B, 17.50; N, 3.95, Br, 60.5.

These brominated polyhydrododecaborates are characterized by infrared absorption bands at 3.9μ , sharp, strong; 11.9μ , 12.4μ , 12.7μ , and 13.0μ , broad, strong; 9.6μ , medium sharp, medium; and 10.5μ , sharp, strong [for the $(CH_3)_4N^+$ ion].

(E) A portion (3.3 g.) of $Na_2B_{12}H_6Br_6 \cdot 6H_2O$, obtained in Part C, is dissolved in about 5 ml. of water. The solution is mixed with a concentrated solution containing 3.3 g. of CsCl. The white crystals which form are separated and they are recrystallized twice from hot water. The product is dried to obtain the dicesium salt as a monohydrate.

Analysis.—Calc'd for $Cs_2B_{12}H_6Br_6 \cdot H_2O$ (percent): B, 14.45; Br, 53.3; H, 0.9; Cs, 29.55. Found (percent): B, 14.54; Br, 52.64; H, 1.25, 1.07; Cs, 29.4.

(F) A portion (9.2 g.) of the compound of Part C, i.e., $Na_2B_{12}H_6Br_6 \cdot 6H_2O$, is dissolved in a minimum quantity of water. The solution is passed through a column packed with an acidic ion exchange resin and the column is flushed with water. The washings and eluate are combined to yield a solution of the acid $H_2B_{12}H_6Br_6$ which, in solvated form, is also written as $(H_3O)_2B_{12}H_6Br_6$.

The process is repeated employing 5.2 g. of hydrated $Na_2B_{12}H_6Br_6$. The acid effluent is evaporated to dryness and the white residue is held under reduced pressure at $70-80^\circ C$. until the vapor pressure is less than 1 micron. The dried product, $H_2B_{12}H_6Br_6$, is a tough amber glass at atmospheric temperature. It is soluble in water, 1,2-di-methoxyethane, ethanol, benzenemethanol mixtures, and cold tetrahydrofuran. It is insoluble in benzene, chloroform, ether, dioxan and hot tetrahydrofuran. The titration curve, employing NaOH, shows a sharp break at pH=7.

(G) About 25 ml. of the acid solution, obtained in Part F, is neutralized with an aqueous solution of $(CH_3)_4NOH$. The white tetramethylammonium salt precipitates but it is not isolated. The crude aqueous reaction mixture is heated to boiling and it is diluted with water to a volume of about 40 ml. to obtain a clear solution. The solution is chilled and white crystals form which are separated by filtration. The crystals are further purified by two crystallizations from boiling water to obtain 0.44 g. of anhydrous $[(CH_3)_4N]_2B_{12}H_6Br_6$.

Analysis.—Calc'd for above compound (percent): B, 17.0; Br, 62.8; C, 12.58; H, 3.96; N, 3.67. Found (percent): B, 18.57; Br, 62.84; C, 12.71, 12.99; H, 4.13, 4.06; N, 3.75, 3.77.

The infrared absorption spectrum of a Nujol mull of the compound shows the following bands characteristic for the anion: 3.95μ , strong; 9.65μ , strong; 10.6μ , strong; 11.8μ , strong; 12.75μ , strong with shoulders at 12.4μ and 13.0μ ; and the following bands characteristic for the cation: 7.1μ , weak; 7.8μ , weak; and 10.55μ , strong.

(H) About 50 ml. of the acid solution, obtained in Part F, is neutralized with aqueous NaOH solution. Excess aqueous $(CH_3)_3SI$ solution is added and the reaction mixture in which a white precipitate is present, is heated to boiling and diluted with water to a total volume of about 100 ml. to yield a clear solution. The hot solution is cooled and the white crystals which form are separated. They are recrystallized twice from hot water to yield 1.04 g. of bis(trimethylsulfonium) hexabromohexahydrododecaborate(2-).

Analysis.—Calc'd for $[(CH_3)_3S]_2B_{12}H_6Br_6$ (percent): B, 16.88; Br, 62.3; C, 9.36; H, 3.14; S, 8.32. Found (percent): B, 16.73; Br, 62.21; C, 10.07, 10.25; H, 3.34, 3.31; S, 8.35.

(I) The process of Part II is repeated, employing an aqueous solution of $(C_2H_5)_3NHCl$ in place of an aqueous solution of the sulfonium iodide. There is obtained 0.69 g. of the triethylammonium salt.

Analysis.—Calc'd for $[(C_2H_5)_3N]_2B_{12}H_6Br_6$ (percent): B, 15.9; Br, 58.7; C, 16.65; H, 4.44; N, 3.43. Found (percent): B, 14.78, 16.70; Br, 59.99; C, 17.16, 17.14; H, 4.65, 4.65; N, 3.34, 3.36.

(J) About 50 ml. of the acid solution, obtained in Part F, is neutralized with aqueous NaOH solution. Concentrated NH_4OH (about 10 ml.) is then added to the solution with stirring after which an excess of an ammoniacal solution of $ZnCl_2$ is added. The white precipitate which forms is separated and it is recrystallized twice from boiling water. There is obtained 0.24 g. of tetraaminozinc hexabromohexahydrododecaborate(2-).

Analysis.—Calc'd for $Zn(NH_4)_4B_{12}H_6Br_6$ (percent): B, 17.32; Br, 64.1; H, 2.42; N, 7.48. Found (percent): B, 17.82; Br, 65.0; H, 2.62; N, 7.31, 7.17.

(K) The process of Part J is repeated employing ammoniacal CuCl_2 in place of the ammoniacal ZnCl_2 solution. The deep blue precipitate which forms is separated and it is crystallized twice from dilute NH_4OH . The product is tetra-aminocopper(II) hexabromohexahydrododecaborate(2-).

Analysis.—Calc'd for $\text{Cu}(\text{NH}_3)_4\text{B}_{12}\text{H}_6\text{Br}_6$ (percent): B, 17.4; Br, 64.2; H, 2.43; N, 7.51; Cu, 8.52. Found (percent): B, 17.11; Br, 63.32; H, 3.11, 2.86; N, 7.52, 7.56; Cu, 8.53.

(L) A solution is prepared containing 10 g. of $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_{12}\cdot 8\text{H}_2\text{O}$ in 150 ml. of water. Liquid bromine is added dropwise to the solution with stirring and the temperature rises rapidly to 90–100° C. The rate of addition of bromine is adjusted to maintain this temperature. After 59 g. of bromine is added, the rate of bromine uptake decreases sharply. An additional 20 g. of bromine is added and the mixture is held at 80–90° C. for 1 hour. The reaction mixture is concentrated to a small volume under reduced pressure and it is separated into two portions. To one part an aqueous solution of CsF is added and to the second part an aqueous solution of $(\text{CH}_3)_4\text{NCl}$ is added. The white precipitates in each reaction are separated by filtration and they are recrystallized from hot water. The compounds are dicesium and bis(tetramethyl-ammonium) decabromodihydrododecaborates(2-).

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_2\text{Br}_{10}\cdot 4\text{H}_2\text{O}$ (percent): B, 10.2; Br, 63.1; Cs, 21.0. Found (percent): B, 10.3; Br, 62.5; Cs, 22.1. Calc'd for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_2\text{Br}_{10}$ (percent): C, 8.88; H, 2.23; B, 12.0; Br, 74.1. Found (percent): C, 8.89; H, 2.36; B, 11.6; Br, 74.4.

(M) A solution is prepared containing 20 g. of $\text{Na}_2\text{B}_{12}\text{H}_{12}\cdot 2\text{H}_2\text{O}$, 100 ml. of water and 100 ml. of methanol. It is cooled to 5–15° C. and bromine is added dropwise with stirring. After 30 ml. is added, the bromine uptake decreases sharply and an additional 30 ml. of bromine is added in one portion. A fast stream of chlorine gas is passed into the solution. The temperature of the reaction mass rises to 50° C. during this step. The solution is placed in a vessel equipped with a water aspirator and the solution is evaporated until excess bromine and the hydrogen chloride and hydrogen bromide formed in the reaction are removed, as shown by the absence of color due to chlorine or bromine. The solution is neutralized with NH_4OH and it is divided into two portions.

To one part an aqueous solution of CsF is added with stirring and the precipitate is separated by filtration. The salt, dicesium dodecabromododecaborate(2-) is purified by crystallization from water.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{Br}_{12}$ (percent): Cs, 19.6; B, 9.56; Br, 70.8. Found (percent): Cs, 18.1; B, 9.57; Br, 71.

The compound is also obtained readily as a monohydrate by crystallization from water.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{Br}_{12}\cdot \text{H}_2\text{O}$ (percent): Cs, 19.4; B, 9.46; Br, 69.9. Found (percent): Cs, 18.5; B, 9.58; Br, 70.1.

To a second part of the neutralized solution an aqueous solution of $(\text{CH}_3)_4\text{NCl}$ is added with stirring. The precipitate is processed as described earlier to obtain bis(tetramethylammonium) dodecabromododecaborate(2-).

Analysis.—Calc'd for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Br}_{12}$ (percent): C, 7.77; H, 1.94; B, 10.5; Br, 77.6. Found (percent): C, 8.29; H, 2.66; B, 10.6; Br, 77.7.

The infrared absorption spectrum of the $\text{B}_{12}\text{Br}_{12}^{2-}$ salts shows a band which is a doublet centered at 990 cm^{-1} .

(N) A portion of the cesium salt obtained in Part M is dissolved in water and the solution is passed through a column packed with an acidic ion-exchange resin. The acidic eluate is evaporated under reduced pressure at 25° C. to give a hydrate of dihydrogen dodecabromododecaborate(2-) as a white crystalline solid.

Analysis.—Calc'd for $(\text{H}_3\text{O})_2\text{B}_{12}\text{Br}_{12}\cdot \text{CH}_2\text{O}$ (percent): B, 10.5; Br, 77.6 (N.E., 617.8). Found (percent): B, 10.3; Br, 77.9 (N.E., 613).

(O) Operating in a photographic dark room, a solution of AgNO_3 (0.006 mole) in water (25 ml.) is added with stirring to a solution of $\text{Cs}_2\text{B}_{12}\text{Br}_{12}\cdot \text{H}_2\text{O}$ (0.003 mole) in water (200 ml.). The compound, $\text{Ag}_2\text{B}_{12}\text{Br}_{12}$, is precipitated in almost quantitative yield as a white solid which is separated, washed and dried. The infrared spectrum of the compound shows strong absorption bands at 10.05 and 10.17 μ with a feeble spur at 10 μ .

Analysis.—Calc'd for $\text{Ag}_2\text{B}_{12}\text{Br}_{12}$ (percent): B, 9.95. Found (percent): B, 9.92.

The acid, obtained in Part N, can be reacted in aqueous solution with salts, e.g., carbonates, chlorides, nitrates and the like, to obtain a wide range of products. To illustrate, ZnCl_2 reacts with the acid to form $\text{ZnB}_{12}\text{Br}_{12}$; CuCl_2 reacts with the acid to form the copper salt as a pale green hydrate, $\text{Cu}(\text{H}_2\text{O})_4\text{B}_{12}\text{Br}_{12}$ which upon dehydration at 90° C. under low pressure becomes purple.

EXAMPLE 4

(A) A reaction vessel is charged with 22.4 g. of $\text{Na}_2\text{B}_{12}\text{H}_{12}\cdot 2\text{H}_2\text{O}$, 50 ml. of water and 150 ml. of methanol. The solution is stirred and a solution of 25.4 g. of iodine in 200 ml. of methanol is added gradually. The iodine color disappears immediately and a slight rise in temperature occurs. The solution is neutralized with NH_4OH and an aqueous solution of $(\text{CH}_3)_4\text{NCl}$ is added with stirring. The precipitate which forms is separated and it is crystallized several times from water. The product is bis(tetramethylammonium)iodoundecahydrododecaborate(2⁻).

Analysis.—Calc'd for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{11}\text{I}$ (percent): C, 23.1; H, 8.42; B, 31.3; I, 30.5. Found (percent): C, 23.6; H, 8.73; B, 30.8; I, 30.4.

The infrared absorption spectrum shows the following characteristic bands (expressed as cm^{-1}): 1280, weak; 1050, strong; 950, strong; ca. 800, strong, broad; and 720, strong.

(B) A solution containing 10 g. of $\text{Na}_2\text{B}_{12}\text{H}_{12}\cdot 2\text{H}_2\text{O}$ in a minimum amount of water is passed through a column packed with an acidic ion-exchange column. The column is washed to remove all of the acid and 200 ml. of an acidic eluate is obtained. There is added to this solution 200 ml. of $\text{C}_2\text{H}_5\text{OH}$ and 11.34 g. of iodine. The mixture is permitted to stand 2 hours at about 25° C. at which time the iodine color is gone. Tetramethylammonium chloride (15 g.) is added to the solution with stirring and the precipitate which forms is processed as described in Part A to obtain $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{11}\text{I}$. Analysis of the compound shows 22.2% C, 8.23% H, 29.1% B and 23.6% I.

Passage of an aqueous solution of $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{11}\text{I}$ through a column filled with a commercial acid ion-exchange resin yields an aqueous solution of the acid $\text{H}_2\text{B}_{12}\text{H}_{11}\text{I}$. Evaporation of the solution yields a hydrate of the crystalline acid which is viewed as $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_{11}\text{I}$. Optionally, the acid effluent from the ion-exchange column is neutralized with an aqueous solution of NaOH and the neutral solution is evaporated to dryness to obtain $\text{Na}_2\text{B}_{12}\text{H}_{11}\text{I}$ as a crystalline compound.

(C) The procedure of Part A is repeated except that 50.8 g. of iodine is employed and cesium fluoride is used instead of the tetramethylammonium chloride. The product obtained is mixed salt containing CsI and $\text{Cs}_2\text{B}_{12}\text{H}_{10}\text{I}_2$ in equimolar proportions.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{10}\text{I}_2\cdot \text{CsI}$ (percent): Cs, 43.7; B, 14.1; I, 41.4. Found (percent): Cs, 42.9; B, 14.0; I, 41.8.

The infrared absorption spectrum shows the following characteristic bands (expressed as cm^{-1}): 1060, weak; 1045, medium; 955, strong, slightly broad; 835, weak; 815, medium; 785, strong; 760, weak; 738, medium and 720, weak.

(D) An aqueous solution of $\text{H}_2\text{B}_{12}\text{H}_{12}$ is prepared as described in Part B from 50 g. of $\text{Na}_2\text{B}_{12}\text{H}_{12}\cdot 2\text{H}_2\text{O}$. The acidic eluate is mixed with 114 g. of iodine and the mixture is allowed to stand at about 25° C. until reaction is complete. An aqueous solution of CsOH is added with stirring and the precipitate is processed as described in previous parts.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{10}\text{I}_2$ (percent): B, 19.7; I, 38.5; H, 1.52; Cs, 40.3. Found (percent): B, 16.2; I, 38.1; H, 1.48; Cs, 41.2.

(E) A solution is prepared which consists of 25 ml. of water and 2.1 g. of $\text{Na}_2\text{B}_{12}\text{H}_{12}\cdot \text{H}_2\text{O}$. The solution is swirled at atmospheric temperature (about 25° C.) while portions of a solution of 6 g. of iodine in 100 ml. of ethyl alcohol are added. Decolorization occurs fairly rapidly until 40 ml. of the iodine solution is added. Another 40 ml. is added and the dark mixture is allowed to stand at atmospheric temperature for 1 hour. The mixture is then evaporated under reduced pressure and a tacky light yellow solid is obtained as a residue. The solid, which is the sodium salt of diiododecahydrododecaborate, is dissolved in 15 ml. of water and excess aqueous 50% cesium fluoride solution is added with stirring. The precipitate which forms is separated by filtration and it is recrystallized from 10 ml. of water. Large white crystals are obtained which are dried at 65° C. at 0.1 mm. pressure for 3 hours. The product is dicesium diiododecahydrododecaborate (2⁻), i.e., $\text{Cs}_2\text{B}_{12}\text{H}_{10}\text{I}_2$. The identity of the compound is confirmed by its infrared absorption spectrum and by elemental analysis. The infrared spectrum shows strong bands at 10.5 μ , 12.3 μ , 12.7 μ , 13.6 μ and 13.8 μ , in addition to the characteristic B—H and B_{12} skeletal bands at 4.0 μ and 9.6 μ , respectively.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{10}\text{I}_2$ (percent): B, 19.68; I, 38.49. Found (percent): B, 19.33; I, 39.00.

(F) One-half of the quantity of $\text{Cs}_2\text{B}_{12}\text{H}_{10}\text{I}_2\cdot \text{CsI}$ obtained in Part C is added to a solution of 115 g. of ICl in 150 ml. of CCl_4 . The mixture is heated at 80° C.

for 8 hours with stirring. It is filtered and the solid product is extracted with Cs_2 to remove free iodine and unreacted ICl . The solid residue is dissolved in water and an aqueous solution of CsCl is added to form a cream-colored precipitate. The product is separated and crystallized twice from water to yield dicesium dodecaiodododecaborate(2-).

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{I}_{12}$ (percent): Cs, 13.8; B, 6.76; I, 79.4. Found (percent): Cs, 13.2; B, 6.67; I, 78.7.

Passage of an aqueous solution of $\text{Cs}_2\text{B}_{12}\text{I}_{12}$ through a column filled with a commercial ion-exchange resin yields an aqueous solution of $\text{H}_2\text{B}_{12}\text{I}_{12}$. Neutralization of this solution with an aqueous solution of NaOH and evaporation of the reaction mixture yields $\text{Na}_2\text{B}_{12}\text{I}_{12}$, generally as the dihydrate or hexahydrate, i.e., $\text{Na}_2\text{B}_{12}\text{I}_{12} \cdot 2\text{H}_2\text{O}$ or $\text{Na}_2\text{B}_{12}\text{I}_{12} \cdot 6\text{H}_2\text{O}$.

(G) Operating in a photographic dark room, a solution of AgNO_3 (0.68 g.) in water (20 ml.) is added to a stirred solution of $\text{Na}_2\text{B}_{12}\text{I}_{12} \cdot 6\text{H}_2\text{O}$ (3.61 g.) in water (100 ml.). The precipitate which forms is separated, washed and dried to obtain $\text{Ag}_2\text{B}_{12}\text{I}_{12}$ as an off-white product weighing 3.63 g.

Analysis.—Calc'd for $\text{Ag}_2\text{B}_{12}\text{I}_{12}$ (percent): Ag, 11.6; B, 6.95; I, 81.5. Found (percent): Ag, 10.7; B, 7.03; I, 76.7.

The similarity in chemical behavior of the dodecaborate moiety and a benzene nucleus, previously referred to as "aromaticity," is shown by the dehalogenation of the iodine-substituted dodecaborates to yield the parent dodecahydrododecaborate. To illustrate, 5.0 g. of $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{11}\text{I}$ prepared as described in Example 4, Part A, is mixed with 200 ml. of liquid ammonia and potassium metal (ca. 0.5 g.) is added in small pieces until the blue color of free potassium persists. The liquid ammonia is evaporated and the white residue is crystallized from water to obtain $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{12}$. In like manner, 4.55 g. of $\text{Cs}_2\text{B}_{12}\text{H}_{10}\text{I}_2$, obtained as described in Example 4, Part D, is dissolved in 25 ml. of liquid ammonia and treated with 1.2 g. of potassium to obtain $\text{Cs}_2\text{B}_{12}\text{H}_{12}$.

EXAMPLE 5

(A) A solution is prepared containing 6 g. of the hydrate of $\text{Na}_2\text{B}_{12}\text{H}_6\text{Br}_6$ (see Example 3, Part C) in 50 ml. of water. The solution is cooled to about -30°C . and chlorine gas is passed into it until the gas is no longer absorbed. The solution is neutralized with NH_4OH and a concentrated solution of CsCl is added. A precipitate forms and the mixture is heated until a clear solution is obtained. The solution is cooled and the crystals which form are collected. They are recrystallized from water to yield dicesium hexabromotrichlorotrihydrododecaborate(2-) as a dihydrate.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_3\text{Br}_6\text{Cl}_3 \cdot 2\text{H}_2\text{O}$ (percent): B, 12.7; Br, 47.0; Cl, 10.4. Found (percent): B, 12.7; Br, 46.7; Cl, 10.1.

The infrared absorption spectrum of the compound shows the following characteristic bands (expressed as cm^{-1}): 2560, medium; 1630, medium; 1040, very sharp; 860, strong, broad; and 730-705, medium, broad.

(B) A solution is prepared containing 10 g. of $\text{Cs}_2\text{B}_{12}\text{H}_8\text{F}_4$ (see Example 1, Part C) in 30 ml. of water. The solution is heated almost to boiling and 8 ml. of bromine is added dropwise and with stirring. The solution is now heated to boiling, chlorine is passed into the mixture and four portions of 2 ml. each of bromine are added gradually. The solution is cooled and the solid which precipitates is separated. It is redissolved in hot water, a small quantity of aqueous CsOH is added to assure that the solution is basic and the mixture is cooled. The crystals which form are separated and recrystallized from hot water to obtain dicesium octabromotetrafluorododecaborate(2-).

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_8\text{Br}_8\text{F}_4$ (percent): B, 11.8; F, 6.8; Br, 57.0. Found (percent): B, 12.9; F, 6.74; Br, 57.06.

(C) A reaction mixture consisting of 14 g. of hydrated $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_{11}\text{I}$ and 30 g. of anhydrous HF is heated with agitation under autogenous pressure at 90°C . for 4 hours. The reaction vessel is cooled, vented and swept with a stream of nitrogen gas. The reaction mixture is neutralized with CsOH and the cesium salt which precipitates is purified as described in earlier examples by crystallization from water to obtain a product which is principally $\text{Cs}_2\text{B}_{12}\text{H}_8\text{F}_3\text{I}$.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_8\text{F}_3\text{I}$ (percent): I, 21.5; F, 9.7. Found (percent): I, 20.9; F, 10.1.

Examples 1 through 5 illustrate compounds of the invention in which X is halogen and methods for their preparation. The processes are generic to the preparation of halogen-bearing compounds and can be employed to obtain compounds having a wide range of halogen substituents, both as to number and

kind. To illustrate, the processes can be employed to obtain compounds having combinations of F, Cl, Br, and I substituents, e.g., $(\text{NH}_4)_2\text{B}_{12}\text{Cl}_5\text{I}$, $[\text{Zn}(\text{NH}_3)_4]\text{B}_{12}\text{F}_3\text{Br}_3\text{I}_6$, $\text{Na}_2\text{B}_{12}\text{F}_4\text{Cl}_3\text{Br}_2\text{I}_3$ and the like. In examples given later, it is shown that dodecaborates bearing X groups other than halogens can be employed as reactants to obtain compounds having mixed substituents, e.g., $\text{CaB}_{12}\text{H}_5\text{Cl}_5(\text{C}_2\text{H}_5\text{C}_6\text{H}_5)_2$, $[(\text{CH}_3)_3\text{S}]_2\text{B}_{12}\text{H}_6\text{Cl}_4\text{SO}_2\text{C}_6\text{H}_5)_2$, $(\text{pyridinium})_2\text{B}_{12}\text{H}_5\text{Cl}_6\text{C}(\text{O})\text{C}_6\text{H}_5$ and the like.

EXAMPLE 6

(A) A small portion of the compound obtained as described in Example A, i.e., disodium dodecahydrododecaborate(2⁻), is dissolved in a few cc. of water and the solution is added carefully to a few cc. of ice-cold concentrated nitric acid to form a clear amber solution. The solution is allowed to warm to about 25° C. and it is made alkaline with aqueous sodium hydroxide. An aqueous solution of tetramethylammonium chloride is added and a white precipitate forms which is the tetramethylammonium salt of a nitrated dodecaborate anion. The infrared absorption spectrum of the product, which is bis(tetramethylammonium) nitroundecahydrododecaborate(2⁻), shows absorption bands at 6.35 μ and 7.74 μ (characteristic for the nitro group) and at 3.9 μ and at 9.25 μ .

Analysis.—Calc'd for $(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{11}\text{NO}_2\cdot\text{H}_2\text{O}$ (percent): C, 26.52; H, 10.30; B, 35.84; N, 14.08. Found (percent): C, 26.3; H, 10.34; B, 37.99; N, 11.02.

(B) A solution consisting of about 5 g. of $\text{Na}_2\text{B}_{12}\text{H}_{12}$ (containing water of hydration) in 5 ml. of water is added dropwise with stirring to 10 ml. of 70% HNO_3 , cooled in an ice-salt bath. The temperature is kept at 20–25° C. during the addition. The dark green solution is cooler and neutralized slowly with 8 ml. of aqueous 50% NaOH . The mixture is extracted with tetrahydrofuran several times. The extracts are combined and blown with air to remove the tetrahydrofuran. An oil (3.5 g.) remains to which 2 ml. of aqueous 50% CsF solution is added. A precipitate forms which is separated and recrystallized from water twice to give brownish-yellow crystals of dicesium nitroundecahydrododecaborate. The crystals ignite readily on a hot plate but they do not explode when struck with a hammer.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{NO}_2$ (percent): Cs, 58.7; B, 28.7; H, 3.4; N, 3.1. Found (percent): Cs, 51.5; B, 28.25; H, 3.10; N, 3.37.

(C) A solution is prepared which contains 3 ml. of water and 1.65 g. of disodium dodecahydrododecaborate. The solution is added dropwise and with stirring to 15 ml. of concentrated nitric acid which is cooled in ice. The reaction mixture is allowed to warm to atmospheric temperature (about 25° C.) and it is then made basic by adding 23 ml. of a 30% aqueous sodium hydroxide solution. The reaction mixture is evaporated to dryness under reduced pressure to obtain a solid yellow residue. The solid is extracted with tetrahydrofuran to dissolve the nitrated polyhydropolyborate. The solution is filtered and dioxane is added to the filtrate. The filtrate is concentrated under reduced pressure until a yellow solid precipitates. The solid is collected on a filter; it is washed with dioxane and dried at low pressure at 90° C. to give 0.47 g. of disodium nitroundecahydrododecaborate containing two moles of dioxane of solvation. The identity of the compound, which has the formula,



is confirmed by its infrared absorption spectrum and by elemental analysis. The infrared absorption spectrum shows bands at 4.0 μ and 9.3 μ , characteristic of the polyhydrododecaborate anion, and bands at 6.35 μ and 7.75 μ , characteristic of the nitro group. This compound is not shock-sensitive.

Analysis.—Calc'd for $\text{Na}_2\text{C}_4\text{H}_7\text{B}_{12}\text{NO}_6$ (percent): Na, 11.2; C, 23.5; H, 6.65; B, 31.75; N, 3.32. Found (percent): Na, 10.3; C, 22.6; H, 6.23; B, 31.1; N, 3.46.

Example 6 illustrates compounds of the invention in which X is a nitro group.

Compounds having a plurality of nitro groups on the dodecaborate ion, e.g., 2,3,4, or more nitro groups, can be obtained by employing a higher concentration of nitric acid in the reaction and by operating at temperatures higher than atmospheric, e.g., at 40° C. or higher. Nitration can also be conducted in several steps to obtain a higher degree of substitution.

The compounds of Example 6 can be converted by simple metathetic reactions to a broad range of compounds, e.g., $\text{Na}_2\text{B}_{12}\text{H}_{11}\text{NO}_2$, $[(\text{C}_2\text{H}_5)_2\text{NH}]_2\text{B}_{12}\text{H}_{11}\text{NO}_2$, $(\text{C}_6\text{H}_5\text{NHNH}_3)_2\text{B}_{12}\text{H}_{11}\text{NO}_2$, $\text{CsHB}_{12}\text{H}_{11}\text{NO}_2$, $\text{Ag}_2\text{B}_{12}\text{H}_{11}\text{NO}_2$, $\text{Al}_2(\text{B}_{12}\text{H}_{11}\text{NO}_2)_3$, and $\text{SnB}_{12}\text{H}_{11}\text{NO}_2$.

The process of Example 6 illustrates broadly the preparation of nitro-substituted dodecaborates. The process can be used with dodecaborates bearing substituents

other than —NO_2 groups to obtain compounds of the invention having both —NO_2 groups and other groups. The broad process can be used to prepare, for example, $\text{Na}_2\text{B}_{12}\text{H}_9(\text{NO}_2)_3$, $\text{K}_2\text{B}_{12}\text{H}_7(\text{NO}_2)_5$, $\text{Cr}_2[\text{B}_{12}\text{H}_9(\text{NO}_2)_3]_3$, $\text{Fe}_2(\text{B}_{12}\text{H}_{11}\text{NO}_2)_3$, $[(\text{C}_6\text{H}_5\text{CH}_2)(\text{CH}_3)_3\text{N}]_2\text{B}_{12}\text{H}_{11}\text{NO}_2$, and the like. It can be used to prepare $\text{Cs}_2\text{B}_{12}\text{H}_9(\text{C}_6\text{H}_{11})(\text{NO}_2)_2$ from $\text{Cs}_2\text{B}_{12}\text{H}_{11}(\text{C}_6\text{H}_{11})$; $\text{Na}_2\text{B}_{12}\text{H}_4(\text{C}_{10}\text{H}_{21})_6(\text{NO}_2)_2$ from $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_6(\text{C}_{10}\text{H}_{21})_6$ and $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{10}(\text{OC}_4\text{H}_9)\text{NO}_2$ from $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OC}_4\text{H}_9$. The halogen-bearing compounds obtained by the processes of Examples 1–5 can be nitrated by the process of Example 6 to obtain halogenated nitro-substituted compounds, e.g., $(\text{NH}_4)_2\text{B}_{12}\text{H}_6\text{Cl}_6\text{NO}_2$, $\text{Na}_2\text{B}_{12}\text{H}_3\text{Cl}_7(\text{NO}_2)_2$, $\text{Cs}_2\text{B}_{12}\text{H}_7\text{Br}_3(\text{NO}_2)_2$, $\text{CaB}_{12}\text{H}_2\text{Br}_9\text{NO}_2$, $\text{Li}_2\text{B}_{12}\text{H}_8\text{I}_2(\text{NO}_2)_2$, $\text{CaB}_{12}\text{H}_{10}\text{FNO}_2$, and the like.

A solution is prepared which contains 1.8 g. of the solvated sodium polyhydro-polyborate obtained as described in Example A (i.e., disodium dodecahydrododecaborate), 25 ml. of water and 0.54 g. of sodium nitrite (NaNO_2). The solution is chilled to below 5°C . and it is acidified with dilute sulfuric acid. The solution is clear yellow in color at low temperatures and it becomes deep green or warming to atmospheric temperature (about 25°C .). An aqueous solution of cesium hydroxide is added to the green solution with stirring and a yellow solid precipitates which is separated by filtration. The solid is recrystallized twice from water, and it is dried at about 25°C . under very low pressure (less than 0.01 mm.). There is obtained 1.0 g. of dicesium nitrosoundecahydrododecaborate (2^-), i.e., $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{NO}$. The infrared absorption spectrum of the compound shows bands at 4.0μ , 7.3μ and 9.5μ .

Example 7 illustrates compounds of the invention in which the substituent X is nitroso and their preparation. The process is broadly operable for introducing —NO groups into dodecaborates. It can be used to prepare, for example, $\text{SrB}_{12}\text{H}_{10}(\text{NO})_2$, $\text{CaB}_{12}\text{H}_{10}(\text{NO})_2$, $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{11}\text{NO}$, $(\text{NH}_2\text{NH}_3)_2\text{B}_{12}\text{H}_{11}\text{NO}$, and the like. Dodecaborates can be employed as reactants which bear substituents other than —NO groups. To illustrate, $(\text{NH}_4)_2\text{B}_{12}\text{H}_{10}(\text{OC}_6\text{H}_{11})\text{NO}$ can be obtained from $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OC}_6\text{H}_{11}$; $\text{Na}_2\text{B}_{12}\text{H}_{10}(\text{SO}_2\text{C}_6\text{H}_5)\text{NO}$ can be obtained from $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{SO}_2\text{C}_6\text{H}_5$, and the like.

EXAMPLE 8

(A) A reaction vessel is charged with a solution consisting of 20 g. of $\text{Na}_2\text{B}_{12}\text{H}_{12}\cdot 2\text{H}_2\text{O}$ and 200 ml. of N-methyl-2-pyrrolidone. The solution is stirred and 25 ml. of hydrochloric acid is added. The mixture is filtered and the filtrate is distilled until the pot temperature reaches 180°C . The mixture is held at this temperature for 3 hours and it is then poured into 600 ml. of alcohol. The resulting clear solution is mixed with a solution of 15 g. of CsOH in 200 ml. of alcohol. A white precipitate forms which is separated by filtration. The solid is crystallized from water to obtain 5.7 g. of product (designated as Product A). A portion (4.5 g.) of the solid is added to 25 ml. of 2.5% aqueous NaOH solution and the mixture is refluxed for 2 hours. The mixture is filtered and a solution of CsOH in ethanol is added with stirring. The precipitate which forms is separated and crystallized from water to yield dicesium monohydroxyundecahydrododecaborate (2^-).

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OH}$ (percent): B, 30.6; H, 2.8; Cs, 62.8. Found (percent): B, 30.1; H, 2.8; Cs, 61.8.

Crystallization of the compound from aqueous cesium bromide solution yields the double salt $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OH}\cdot\text{CsBr}$. (B) A pressure vessel is charged with a solution of 5 g. of the hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$ in 25 ml. of water. The vessel is closed and the solution is heated under autogenous pressure for 5 hours at 200°C . The vessel is opened and aqueous cesium fluoride is added to the reaction mixture. The precipitate which forms is processed as described in Part A to yield $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OH}$.

(C) Hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ (29 g.; N.E., 194) is added slowly and with stirring to 100 ml. of acetone which is cooled with ice to keep the temperature at $20\text{--}25^\circ\text{C}$. The reaction mixture is stirred for 15 minutes at 25°C ., 15 ml. of 50% aqueous NaOH solution is added, followed by 60 g. of aqueous 50% CsF solution. The precipitate which forms is separated to obtain 29 g. of $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OH}$. The compound is purified by recrystallization from water.

(D) A mixture of 5 g. of $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OCH}(\text{CH}_3)_2$, prepared as described in Example 13, Part B, and 25 ml. of 48% hydrogen bromide is refluxed for a short time. Excess hydrogen bromide is removed by blowing the mixture with air and sufficient 50% NaOH is added to make the solution basic. The precipitate which forms is processed as described in Part A to yield the double salt, $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OH}\cdot\text{CsBr}$.

An aqueous solution of the double salt



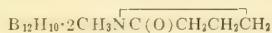
is passed through a column packed with an acid ion-exchange resin to obtain the acid $\text{H}_2\text{B}_{12}\text{H}_{11}\text{OH}$ in solution. The acidic eluate is neutralized with NaOH and the solution is evaporated to obtain $\text{NaB}_{12}\text{H}_{11}\text{OH} \cdot \text{NaBr}$. An aqueous solution of this sodium salt is mixed with an aqueous solution of $(\text{CH}_3)_4\text{NCl}$ to precipitate the tetramethylammonium salt in pure form.

Analysis.—Calc'd for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{11}\text{OH}$ (percent): B, 42.5; C, 31.47; H, 11.8; N, 9.1. Found (percent): B, 43.7; C, 27.8; H, 11.4; N, 8.2.

(E) A reaction vessel is charged with 3.0 g. of hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ (N.E., 154) and 1.75 g. of oxalic acid. The vessel is placed in a boiling water bath and the mixture is stirred for 5 minutes. An exothermic reaction sets in and the temperature rises to a maximum of 120°C . with vigorous bubbling. The mixture is cooled to about 25°C . and 5 ml. of water is added. The solution is neutralized with aqueous CsOH solution to phenolphthalein end point. A precipitate forms and the reaction mixture is heated to boiling with addition of the minimum amount of water needed to dissolve the precipitate at the boiling point. The solution is cooled in an ice-water bath and the crystals which form are separated. They are crystallized from hot water to obtain 1.6 g. of $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OH}$.

(F) A mixture of 8.75 g. of oxalic acid and 3.0 g. of hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ is heated at 150°C . for 15 minutes. The reaction mixture is processed as described in Part E to obtain $\text{Cs}_2\text{B}_{12}\text{H}_{10}(\text{OH})_2$.

(G) A reaction vessel is charged with a solution consisting of 20 g. of $\text{Na}_2\text{B}_{12}\text{H}_{12} \cdot 2\text{H}_2\text{O}$ and about 200 ml. of *N*-methyl-2-pyrrolidone. The solution is stirred and 25 ml. of hydrochloric acid is added. The mixture is filtered and the filtrate is distilled until a pot temperature of 205°C . is reached. The mixture is held at this temperature for 4 hours and it is then poured into 600 ml. of ethyl alcohol. The precipitate which forms is separated by filtration. It is purified by dissolving in acetonitrile and reprecipitating with ethanol. The product (7.8 g.) so obtained (which is



and is designated as Product B) is mixed with 50 ml. of 6% aqueous NaOH solution, the mixture is refluxed for 4 hours and then allowed to cool.

A portion of the above reaction mixture is added with stirring to a solution of 6 g. of $(\text{CH}_3)_4\text{NOH}$ in 400 ml. of ethyl alcohol. The mixture is evaporated to dryness, leaving a syrupy residue. The residue is mixed with 150 ml. of isopropyl alcohol and forms an oil. The oil is crystallized from solution in aqueous ethyl alcohol to yield bis(tetramethylammonium) dihydroxydecahydrododecaborate⁽⁻⁾.

Analysis.—Calc'd for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{10}(\text{OH})_2$ (percent): B, 40.3; C, 29.8; H, 11.2. Found (percent): B, 40.4; C, 26.1; H, 10.8.

The remaining portion of the reaction mixture is evaporated to a small volume and a concentrated solution of CsOH is added. The precipitate which forms is separated, recrystallized twice from water and dried 15 hours at 56°C . under very low pressure.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{10}(\text{OH})_2$ (percent): B, 28.4; H, 3.1; Cs, 58.1. Found (percent): B, 28.23, 28.31; H, 3.38; Cs, 58.25.

(H) A concentrated aqueous solution of $\text{Na}_2\text{B}_{12}\text{H}_{12} \cdot 2\text{H}_2\text{O}$ is passed through a column filled with an acidic ion exchange resin. The eluate is an aqueous solution of $\text{H}_2\text{B}_{12}\text{H}_{12}$. A portion of this solution containing 0.12 mole of the acid is reacted with the exact equivalent quantity of aluminum metal. The reaction proceeds rapidly with evolution of hydrogen and an aqueous solution of $\text{Al}_2(\text{B}_{12}\text{H}_{12})_3$ forms. The solution is evaporated to dryness and the residue is dried intensively over P_2O_5 at 25°C . to obtain the salt with sixteen moles of water of hydration.

Analysis.—Calc'd for $\text{Al}_2(\text{B}_{12}\text{H}_{12})_3 \cdot 16\text{H}_2\text{O}$ (percent): Al, 6.86; B, 49.56; H, 8.97. Found (percent): Al, 6.61; B, 50.6; H, 9.36.

A portion of the above hydrated aluminum salt is heated at very low pressure for 44.5 hours at 148°C . over P_2O_5 . A portion of the dry residue (8.58 g.) is mixed with 100 ml. of water and 80 ml. of 0.912 N aqueous CsOH solution is added with stirring. The mixture is filtered to remove insoluble $\text{Al}(\text{OH})_3$ and the filtrate is evaporated to dryness to obtain the solid dicesium trihydroxynonahydrododecaborate⁽²⁻⁾.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_9(\text{OH})_3$ (percent): B, 28.49; H, 2.65; Cs, 58.32. Found (percent): B, 31.4; H, 3.08, 2.93; Cs, 57.63, 55.2.

A second portion (18.5 g.) of the above hydrated aluminum salt is heated at very low pressure for 83 hours at 148°C over P_2O_5 . Water and hydrogen are released and a 20.9% loss in weight is noted. The residue (14.7 g.) is dissolved in 100 ml. of 1.44 N hydrochloric acid and the solution is diluted to a volume of 720

ml. The diluted solution is passed through a column filled with an acidic ion exchange resin and the eluate is neutralized with $(\text{CH}_3)_4\text{NOH}$ to obtain an aqueous solution of $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_9(\text{OH})_3$. Neutralization of the eluate with NH_4OH yields $(\text{NH}_4)_2\text{B}_{12}\text{H}_9(\text{OH})_3$.

(I) An aqueous solution of $\text{H}_2\text{B}_{12}\text{H}_{12}$ is neutralized with the exact quantity of $\text{Be}(\text{OH})_2$ to provide a neutral solution of $\text{BeB}_{12}\text{H}_{12}$. The solution is evaporated to dryness and the residue is dried intensively over P_2O_5 to obtain the tetrahydrate of the beryllium salt.

Analysis.—Calc'd for $\text{BeB}_{12}\text{H}_{12} \cdot 4\text{H}_2\text{O}$ (percent): B, 58.22; Be, 4.04; H, 6.04. Found (percent): B, 60.26; Be, 4.12, 3.94; H, 8.73.

A quantity (9.93 g.) of the above beryllium salt is heated under very low pressure over P_2O_5 for 52 hours at 148°C . The dried product, which shows a weight loss of 9.83%, is suspended in 100 ml. of water, 90 ml. of 1 N NH_4OH is added with stirring, and the mixture is filtered to remove $\text{Be}(\text{OH})_2$. The filtrate is evaporated to dryness to yield the solid $(\text{NH}_4)_2\text{B}_{12}\text{H}_9(\text{OH})_3$.

(J) A reaction vessel is charged with 70 ml. of tert.-butanol and 6 g. of $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_{12} \cdot 6\text{H}_2\text{O}$. The mixture is refluxed for 2 hours and water is added. The solution is boiled to remove the butanol as an azeotrope with water. The remaining solution contains the acid $\text{H}_2\text{B}_{12}\text{H}_8(\text{OH})_4$.

A portion of the above solution is neutralized with ammonia hydroxide to obtain $(\text{NH}_4)_2\text{B}_{12}\text{H}_8(\text{OH})_4$ in solution and an aqueous solution of CsF is added. The solution is concentrated to a small volume from which the cesium salt crystallizes on cooling. The compound, which is very water-soluble, is purified by recrystallization from water.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_8(\text{OH})_4 \cdot 2\text{H}_2\text{O}$ (percent): B, 25.0; H, 3.16; Cs, 51.6. Found (percent): B, 25.0; H, 3.10; Cs, 55.8.

The infrared absorption spectrum of a Nujol mull of the compound shows the following principal bands (expressed as cm^{-1}): 3580, strong; 3330, medium; 1630, medium; 1015, very strong, broad; 1025, very strong; 985, weak; 882, strong; and 740–725, very strong, broad.

A portion of the above solution is neutralized with ammonium hydroxide and there is then added an aqueous solution of $(\text{CH}_3)_4\text{NCl}$ to obtain the tetramethylammonium salt of $\text{B}_{12}\text{H}_8(\text{OH})_4^{-2}$. The compound is recrystallized from water.

Analysis.—Calc'd for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_8(\text{OH})_4$ (percent): B, 36.7; H, 10.3; C, 27.1; N, 7.92. Found (percent): B, 37.8; H, 10.5; C, 27.1; N, 8.90.

The infrared absorption spectrum of a Nujol mull of the compound shows the following principal bands, expressed as cm^{-1} : 3330, medium; 1140, medium; 1070, weak; 1050, weak; 1025, strong; 980, medium; 950, strong; 900, weak; and 725, strong, broad.

(K) Compounds bearing $-\text{OH}$ substituents are also obtained by heating a hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$ with SO_2 . Thus, a mixture consisting of 20 g. of crystalline hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ and 50 g. of sulfur dioxide is heated in a stainless steel pressure vessel with agitation under autogenous pressure at 60°C . for 5 hours. The vessel is cooled and vented to remove unreacted sulfur dioxide. The process is repeated three more times and the four crude reaction products are combined. The mixture is neutralized with $(\text{CH}_3)_4\text{NOH}$ and the precipitate which forms is separated, washed and dried to obtain 43 g. of $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{11}\text{OH}$. The compound is further purified by recrystallization from water. Its infrared spectrum shows absorption bands at 2.8, 4.0, 7.8, 8.8, 9.2, 9.5, 9.7, 10.55, 11.1, 12.5, and 13.9μ .

(L) A solution is prepared which consists of 1.8 g. of $\text{H}_2\text{B}_{12}\text{H}_{12}$ (calculated on an anhydrous basis from hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$) in 110 ml. of water. To this solution at room temperature (ca. 25°C .) 30.8 ml. of 30% aqueous H_2O_2 is added with stirring. The mixture is allowed to stand at room temperature for 4 days and the solution is then evaporated to dryness under reduced pressure at about 25°C . in a rotating evaporation unit. This operation is conducted behind suitable protective shielding. The residue is dried 18 hours over P_2O_5 and there is obtained 3.08 g. of $\text{H}_2\text{B}_{12}\text{H}_6(\text{OH})_6$. Titration of an aqueous solution of this acid shows that it is a strong acid, i.e., an acid in the class of strong mineral acids. The infrared absorption spectrum of the acid in a mineral oil mull show the following absorption bands: 2.8, 4.0, 9.0, and 10.6μ .

Analysis.—Calc'd for $\text{H}_2\text{B}_{12}\text{H}_6(\text{OH})_6$ (percent): B, 54.2; H, 5.83 (N.E., 120). Found (percent): B, 54.8; H, 6.14 (N.E., 125).

(M) An aqueous solution of the acid of part L is mixed with thallium carbonate and the precipitate which forms is separated. It is recrystallized from water, and dried to obtain the diethallium salt.

Analysis.—Calc'd for $\text{Tl}_2\text{B}_{12}\text{H}_6(\text{OH})_6$ (percent): Tl, 63.2; B, 20.0; H, 1.85. Found (percent): Tl, 62.1; B, 19.5; H, 2.23.

(N) An aqueous solution of the acid of Part L is reacted with CsF to obtain a salt which is very soluble in water. The product is a hydrated double salt of $\text{Cs}_2\text{B}_{12}\text{H}_6(\text{OH})_6$ and CsF whose infrared absorption spectrum shows the following bands: 4.1, 6.1, 8.8, 10.25, and 11.35 μ .

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_6(\text{OH})_6 \cdot \text{CsF} \cdot 4\text{H}_2\text{O}$ (percent): Cs, 54.8; B, 17.86; H, 2.75. Found (percent): Cs, 55.2; B, 17.41; H, 2.45.

(O) Irradiation equipment employed in this process consists of a quartz tube (about 3 cm. x 30 cm.) surrounded by a mercury vapor coil. The tube is charged with 60 ml. of an aqueous solution (0.1035 molar) of $\text{H}_2\text{B}_{12}\text{Cl}_{12}$. The solution is irradiated for 24 hours and the blue suspension which forms is filtered. The solids are set aside and the filtrate is irradiated again for 68 hours. The suspension is filtered and the solids from both filtrations are combined to obtain 1.45 g. of hydrated $\text{H}_2\text{B}_{12}(\text{OH})_{12}$ containing some unreacted $\text{H}_2\text{B}_{12}\text{Cl}_{12}$. In the operation of the process, 90 ml. of hydrogen is evolved and substantially all of the chlorine is recovered as chloride ion (AgCl) in the filtrate.

The above process is repeated employing 100 ml. of a 0.1035 molar solution of $\text{H}_2\text{B}_{12}\text{Cl}_{12}$. There is obtained 3.19 g. of hydrated $\text{H}_2\text{B}_{12}(\text{OH})_{12}$ containing some unreacted starting compound.

The product, as isolated in several runs, ranged in color from white to blue. The product is insoluble in water and conventional organic solvents. It is washed repeatedly with water and ethanol and dried under reduced pressure over P_2O_5 . The product is hydrated $\text{H}_2\text{B}_{12}(\text{OH})_{12}$, also written as $(\text{H}_3\text{O})_2\text{B}_{12}(\text{OH})_{12}$, containing a minor quantity of product which bears chlorine bonded to boron. The composition of the product can be represented as $(\text{H}_3\text{O})_2\text{B}_{12}(\text{OH})_{11.3}\text{Cl}_{0.7}$.

Analysis.—Calc'd for the above mixture (percent): B, 33.7; Cl, 6.47; H, 4.49; O, 55.2. Found (percent): B, 33.6, 33.7; Cl, 6.36, 6.49; H, 4.82, 4.78; O, 51.1.

The acid is insoluble in concentrated sulfuric acid at 25° C. but it dissolves on warming the acid to 90° C. On cooling the sulfuric acid solution, no precipitation occurs. The product in sulfuric acid solution is a compound bearing —OH and —OSO₃H groups, i.e., it can be represented as $\text{H}_2\text{B}_{12}(\text{OH})_n(\text{OSO}_3\text{H})_{12-n}$ where n has a value of 1–12.

The free acid, dihydrogen dodecahydroxydodecaborate, which is usually obtained in hydrated form, is a white solid that is unchanged by heating up to 310° C. The acid is substantially insoluble in water, methanol, ethanol and other lower alkanols, dimethylformamide, dimethylsulfone, benzene, 1,2-dimethoxyethane, acetic acid and pyridine. It dissolves in basic solvents upon the addition of water and it also dissolves in dilute solutions of inorganic bases. Although substantially insoluble in water, sufficient acid does dissolve to give a strongly acid reaction to the water, as determined by pH test papers.

(P) A solution of 5.0 g. of $\text{Cs}_2\text{B}_{12}\text{Br}_{12}$ in 200 ml. of water is irradiated for 20 hours in the unit described in Part O. The solid is separated by filtration to obtain 0.764 g. of $(\text{H}_3\text{O})_2\text{B}_{12}(\text{OH})_{12}$. The product is suspended in water and aqueous CsOH solution is added until the solution is neutral. The acid dissolved during this step in the process. The solution is concentrated by evaporation until crystals of $\text{Cs}_2\text{B}_{12}(\text{OH})_{12}$ appear. The solid crystals are separated and recrystallized twice from water. Some $\text{Cs}_2\text{B}_{12}\text{Br}_{12}$ is present as an impurity.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}(\text{OH})_{12}$ (percent): Cs, 44.3; B, 21.7; H, 2.00. Found (percent): Cs, 38.2; B, 20.36; H, 2.21; Br, 3.75.

The process of Part P is repeated employing 10 g. of $\text{Cs}_2\text{B}_{12}\text{Br}_{12}$ in 200 ml. of water and 1.36 g. of product is isolated. The products obtained in these runs are combined to obtain 20 g. of $\text{Cs}_2\text{B}_{12}(\text{OH})_{12}$. The combined product is purified by dissolving it in water and irradiating the solution for 4 hours. The amount of bromine present in the compound is substantially reduced to obtain a product of the following analysis: Cs, 40.9; B, 20.4; H, 3.16; Br, 0.62.

(Q) Salts of the $\text{B}_{12}(\text{OH})_{12}^{2-}$ anion are obtained by neutralization of the acid obtained in Part P, employing the appropriate base and an aqueous suspension of the acid. The ammonium, methylammonium, and tert-butylammonium salts are prepared by this method. The ammonium salt is purified by crystallization from water, the methylammonium and tert-butylammonium salts by crystallization from aqueous ethanol.

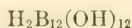
Analysis.—Calc'd for $(\text{NH}_4)_2\text{B}_{12}(\text{OH})_{12}$ (percent): H, 5.41; B, 35.1; N, 7.58; O, 51.9. Found (percent): H, 5.80; B, 34.5; N, 6.58; O, 46.2.

Analysis.—Calc'd for $(\text{CH}_3\text{NH}_2)_2\text{B}_{12}(\text{OH})_{12}$ (percent): H, 6.04; B, 32.7; N, 7.04; O, 48.2; C, 6.04. Found (percent): H, 6.54; B, 32.7; N, 6.04; O, 3.5; C, 5.86.

Analysis.—Calc'd for $[(\text{CH}_3)_3\text{CNH}_2]_2\text{B}_{12}(\text{OH})_{12}$ (percent): H, 7.48; B, 27.0; N, 5.83; O, 39.9; C, 20.0. Found (percent): H, 7.79; B, 27.6; N, 5.96; O, 31.1; C, 19.6.

The cesium, ammonium and tert-butylammonium salts are moderately soluble in water. The cesium salt turns yellow at surfaces exposed to light.

Neutralization of an aqueous suspensions of



with $(\text{CH}_3)_4\text{NOH}$ yields $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}(\text{OH})_{12}$. The salt is very soluble in water and it is not readily isolated in solid form.

Example 8 illustrates the compounds of the invention in which X is hydroxyl and methods for their preparation. The processes of Example 8 are generic to the preparation of hydroxyl-bearing dodecaborates and these processes are operable with reactants bearing substituents other than hydroxyl. To illustrate, compounds can be obtained of the formulas $\text{BaB}_{12}\text{H}_{10}(\text{OCH}_3)(\text{OH})$, $\text{CuB}_{12}\text{H}_9(\text{C}_6\text{H}_{11})(\text{OH})_2$, $\text{K}_2\text{B}_{12}\text{H}_3[\text{C}(\text{CH}_3)_3](\text{OH})_3$, and the like by employing as reactants dodecaborates having as substituents $-\text{OCH}_3$, $-\text{C}_6\text{H}_{13}$ and $-\text{C}(\text{CH}_3)_3$, respectively.

EXAMPLE 9

A reaction vessel is charged with 2.0 g. of $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{10}(\text{OH})_2$ prepared as described in Example 8, Part G, and 10 ml. of glacial formic acid. The mixture is heated at $90-100^\circ\text{C}$. for 3 minutes and it is then poured into water. The solution is filtered and the filtrate is mixed with an aqueous solution of $(n\text{-C}_3\text{H}_7)_4\text{NI}$. The precipitate which forms is separated and it is recrystallized from 50% aqueous ethyl alcohol. The product is bis(tetra-n-propylammonium) diformyloxydodecaborate(2-).

Analysis.—Calc'd for $[(\text{C}_3\text{H}_7)_4\text{N}]_2\text{B}_{12}\text{H}_{10}(\text{O}_2\text{CH})_2$ (percent): B, 21.6; C, 51.8; H, 11.4; N, 4.6. Found (percent): B, 21.6; C, 49.6; H, 11.1; N, 4.56.

(B) A reaction vessel is charged with 25 ml. of formic acid (98–100% purity) and 0.63 g. of $\text{Cs}_2\text{B}_{12}\text{F}_{11}\text{OH}$. The solid dissolves and the solution is heated at steam bath temperatures for 15 minutes. It is then allowed to stand at atmospheric temperature (ca. 25°C .) for about 18 hours. The reaction mixture is evaporated in a Rineo rotary drier under reduced pressure at 60°C . or less. There is obtained 0.67 g. of dicesium formyloxyundecafluorododecaborate(2-), i.e., $\text{Cs}_2\text{B}_{12}\text{F}_{11}\text{OC}(\text{O})\text{H}$. The infrared spectrum of the compound contains bands as follows (expressed as microns): 5.8 (strong), 10.22 (weak), 12.0 (weak), and 15.45 (moderately strong).

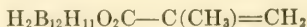
(C) A small platinum tube is charged with 1 g. of $\text{Cs}_2\text{B}_{12}\text{F}_{11}\text{OH}$ and the vessel and contents are cooled in liquid nitrogen. Pressure in the tube is reduced to a low value and 1.0 g. of carbonyl fluoride (COF_2) is added. The tube is sealed, placed in a pressure reactor and heated under 400 atmospheres pressure at 150°C . for 16 hours. It is cooled, opened and allowed to warm to atmospheric temperature. Unreacted COF_2 escapes during this stage of the processing. A white solid, weighing 1.07 g., remains which is dicesium fluoroformyloxyundecafluorododecaborate(2-), i.e., $\text{Cs}_2\text{B}_{12}\text{F}_{11}\text{OC}(\text{O})\text{F}$. The infrared spectrum of the compound displays very strong bands at $5.5 (=0)$ and $10.3\mu [-\text{C}(\text{O})\text{F}]$.

The compound hydrolyzes readily in water, releasing CO_2 .

EXAMPLE 10

A solution consisting of 5 g. of hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ and 25 ml. of glacial acetic acid is stirred for 3 hours at about 25°C . It is then heated for 24 hours at steam bath temperatures ($90-100^\circ\text{C}$.). The solution is cooled and it is mixed with an aqueous 50% solution of CsF . The precipitate which forms is separated by filtration and it is recrystallized from water to obtain 6.4 g. of dicesium monoacetoxyundecafluorododecaborate(2-), i.e., $\text{Cs}_2\text{B}_{12}\text{H}_{11}(\text{O}_2\text{CCH}_3)$.

Examples 9 and 10 illustrate the compounds of the invention in which X is an ester group, i.e., $-\text{OC}(\text{O})\text{R}$. Two generic processes are exemplified which are as follows: (1) reaction of hydroxyl-substituted dodecaborates with anhydrous organic acids or their equivalents (acid anhydrides and acid halides), and (2) reaction of polyhydrododecaborates with an anhydrous organic acid. In either process any organic acid can be employed. For example, $\text{H}_2\text{B}_{12}\text{H}_9(\text{OH})_3$ can be reacted with butyric acid to yield $\text{H}_2\text{B}_{12}\text{H}_9(\text{O}_2\text{CC}_3\text{H}_7)_3$; $\text{H}_2\text{B}_{12}\text{H}_{11}\text{OH}$ can be reacted with methacrylic acid to yield



$\text{H}_2\text{B}_{12}\text{H}_{10}(\text{OH})_2$ can be reacted with benzoyl chloride to yield $\text{H}_2\text{B}_{12}\text{H}_{10}(\text{O}_2\text{CC}_6\text{H}_5)_2$; $\text{H}_2\text{B}_{12}\text{H}_{10}(\text{OH})_2$ can be reacted with octadecanoyl chloride to yield $\text{H}_2\text{B}_{12}\text{H}_{10}(\text{O}_2\text{CC}_{17}\text{H}_{35})_2$. $\text{H}_2\text{B}_{12}\text{H}_{10}(\text{OH})_2$ can be reacted with propiolic acid to yield $\text{H}_2\text{B}_{12}\text{H}_{10}(\text{O}_2\text{CC}_2\text{H})_2$. Similarly, $\text{H}_2\text{B}_{12}\text{H}_{12}$ can be reacted with propionic acid to yield $\text{H}_2\text{B}_{12}\text{H}_{11}(\text{O}_2\text{CC}_2\text{H}_5)$, with hexahydrobenzoic acid to yield $\text{H}_2\text{B}_{12}\text{H}_{11}(\text{O}_2\text{CC}_6\text{H}_{11})$ and with dodecanoic acid to yield $\text{H}_2\text{B}_{12}\text{H}_{11}(\text{O}_2\text{CC}_{11}\text{H}_{23})$.

In the processes of Examples 9 and 10, dodecaborates can be employed as reactants which bear not only—OH groups but other substituent groups as well. To illustrate, $\text{H}_2\text{B}_{12}\text{H}_{10}(\text{C}_2\text{H}_4\text{C}_6\text{H}_5)\text{OH}$ can be reacted with propionic acid to yield $\text{H}_2\text{B}_{12}\text{H}_{10}(\text{C}_2\text{H}_4\text{C}_6\text{H}_5)(\text{O}_2\text{CCH}_2\text{CH}_3)$; $\text{H}_2\text{B}_{12}\text{Cl}_8(\text{OH})_4$ can be reacted with acetic acid to yield $\text{H}_2\text{B}_{12}\text{Cl}_8(\text{O}_2\text{CCH}_3)_4$; $\text{H}_2\text{B}_{12}\text{H}_8(\text{OCH}_3)_2(\text{OH})_2$ can be reacted with formic acid to yield $\text{H}_2\text{B}_{12}\text{H}_8(\text{OCH}_3)_2(\text{O}_2\text{CH})_2$ and $\text{H}_2\text{B}_{12}\text{Br}_9(\text{OH})_3$ can be reacted with trifluoroacetic acid to yield $\text{H}_2\text{B}_{12}\text{Br}_9(\text{O}_2\text{CCF}_3)_3$. Further $\text{H}_2\text{B}_{12}\text{H}_{11}\text{C}(\text{CH}_3)_3$ can be reacted with formic acid to yield $\text{H}_2\text{B}_{12}\text{H}_{10}[\text{C}(\text{CH}_3)_3](\text{O}_2\text{CH})$. $\text{H}_2\text{B}_{12}\text{H}_{10}(\text{SO}_2\text{C}_6\text{H}_5)_2$ can be reacted with acetic acid to yield $\text{H}_2\text{B}_{12}\text{H}_9(\text{SO}_2\text{C}_6\text{H}_5)_2(\text{O}_2\text{CCH}_3)$, and the like.

The dodecaborate acids can be neutralized with organic and inorganic bases to yield a wide range of salts and the compounds are usually isolated in this manner, as illustrated in the examples.

EXAMPLE 11

(A) A solution of 7.5 g. of $\text{Na}_2\text{B}_{12}\text{H}_{12}\cdot\text{H}_2\text{O}$ in 50 ml. of water is passed through a column packed with an acid ion-exchange resin, as described in Example C. The acidic eluate and washings are collected and heated under reduced pressure until the volume is about 50 ml. The solution contains the acid $\text{H}_2\text{B}_{12}\text{H}_{12}$.

The acid solution obtained above is mixed with 10 ml. of 37% formaldehyde solution. The mixture becomes slightly warm but no color change occurs. The mixture is heated on a steam bath for about 1 hour and the solution becomes pink in color. The solution is cooled and it is evaporated under reduced pressure to yield a faintly pink tacky solid.

The solid obtained above is mixed with a solution of 5.0 g. of NaHCO_3 in about 25 ml. of hot water. The solution is cooled and filtered. An aqueous solution of cesium fluoride is added with stirring to the filtrate to form a white precipitate. The precipitate is separated and dried. Elemental analysis of the compound shows that it has the formula $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{X}$, where X consists of one oxygen, one carbon and three hydrogens. The infrared absorption spectrum shows that X is— OCH_3 and that the compound is, therefore, $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OCH}_3$.

Analysis.—Calc'd for $\text{Cs}_2\text{CH}_{14}\text{B}_{12}\text{O}$ (percent): C, 2.74; H, 3.22. Found (percent): C, 3.16; H, 2.20.

(B) Crystalline hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ (5.0 g.) is added slowly to 15 ml. of 37% formaldehyde with stirring and cooling to keep the temperature at about 25° C. The solution is stirred for a few minutes after addition of the acid is completed and 10 ml. of aqueous 50% CsF solution is added. The precipitate which forms is separated by filtration and it is recrystallized from hot water to obtain $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OCH}_3$.

Analysis.—Calc'd for $\text{Cs}_2\text{CH}_{14}\text{B}_{12}\text{O}$ (percent): Cs, 60.6; B, 29.7; C, 2.74; H, 3.22. Found (percent): Cs, 55.3; B, 26.4; C, 2.6; H, 3.1.

(C) A portion (5 g.) of the crystalline hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$ is dissolved in 25 ml. of 99% formic acid. The solution is heated on a steam bath for 3 hours, cooled and an aqueous 50% solution of CsF is added. The precipitate is processed as described in Part B to obtain 3.4 g. of $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OCH}_3$.

(D) A mixture of 2.0 g. of the crystalline hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$ (N.E., 174) and 10 ml. of CH_3OH is heated in a pressure vessel under autogenous pressure for 15 hours at steam bath temperatures. Volatile products formed in the reaction consist of H_2 and CH_4 . The liquid reaction product is mixed with aqueous 50% CsF solution and the precipitate is processed as described in Part B to obtain the methoxy-substituted compound.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OCH}_3$ (percent): B, 29.6; C, 2.7; H, 3.2. Found (percent): B, 25.6; C, 3.1; H, 3.1.

(E) A mixture of 20 g. of CH_3OCH_3 and 12 g. of the crystalline hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$ is heated in a pressure vessel under autogenous pressure at 90° C. for 2 hours. The reaction mixture is divided into two equal parts.

To one part an aqueous solution of CsOH is added until the mixture is neutral. The precipitate is processed as described in Part B to obtain a crystalline product

which is a compound of about 40% $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OCH}_3$ and 60% $\text{Cs}_2\text{B}_{12}\text{H}_{10}(\text{OCH}_3)_2$.

Analysis.—Calc'd for above product (percent): Cs, 59.0; B, 28.8; C, 3.7; H, 3.3. Found (percent): Cs, 56.9; B, 29.0; C, 3.6; H, 3.6.

To the second part, aqueous $(\text{CH}_3)_4\text{NOH}$ is added until the solution is neutral and the precipitate is processed as described in Part B to obtain a crystalline product which is about 40% $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{11}\text{OCH}_3$ and 60% $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{10}(\text{OCH}_3)_2$.

Analysis.—Calc'd for above product (percent): C, 25.1; H, 10.7; N, 5.4. Found (percent): C, 25.6; H, 11.0; N, 5.4.

(F) A mixture of 50 g. of CH_3OCH_3 and 15 g. of the crystalline hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$ is heated in a pressure vessel under autogenous pressure at 110°C . for 1 hour. The reaction mixture is neutralized with aqueous CsOH solution and the precipitate is processed as described in Part B to obtain a dodecaborate bearing two methoxy groups.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{10}(\text{OCH}_3)_2$ (percent): B, 27.7; C, 5.1; H, 3.4. Found (percent): B, 27.1; C, 4.8; H, 3.5.

EXAMPLE 12

(A) A mixture of 5 g. of the crystalline hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$ and 25 ml. of $\text{C}_2\text{H}_5\text{OC}_2\text{H}_5$ is heated in a pressure vessel under autogenous pressure at 60°C . for 10 hours. The reaction mixture, so obtained, is stirred with 10 ml. of aqueous 50% CsF solution. The crystalline Cs salt (1.9 g.) which precipitates is processed as described in Example 11, Part B to obtain cesium hydrogen ethoxyundecahydrododecaborate (-2) with one mole of ethanol as solvent of crystallization.

Analysis.—Calc'd for $\text{CsHB}_{12}\text{H}_{11}\text{OC}_2\text{H}_5 \cdot \text{C}_2\text{H}_5\text{OH}$ (percent): Cs, 32.6; B, 35.5; C, 13.2. Found (percent): Cs, 39.6; B, 36.8; C, 13.2.

(B) A mixture of 5 g. of the crystalline hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$ and 25 ml. of ethanol is heated in a pressure vessel under autogenous pressure for 4 hours at 100°C . Volatile products formed in the reaction contain 83 ml. of hydrogen and 160 ml. of ethane. The non-volatile reaction product is neutralized with aqueous NaOH solution following which an aqueous solution of CsF is added. The precipitate is processed as described in Example 11, Part B, to obtain $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OC}_2\text{H}_5$. The identity of the compound is confirmed by its infrared absorption spectrum.

(C) Acetaldehyde (25 ml.) is cooled in an ice bath and 5 g. of crystalline hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ is slowly added with stirring. After addition is completed, the solution is stirred a short period and 10 ml. of 50% aqueous CsF is added. The precipitate is processed as described earlier to obtain the monoethoxy derivative.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OC}_2\text{H}_5$ (percent): Cs, 58.7; B, 28.7; C, 5.3; H, 3.5. Found (percent): Cs, 55.2; B, 23.9; C, 5.3; H, 3.5.

(D) A solution of 10 g. of crystalline hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ (N.E., 222) in 20 ml. of glacial acetic acid is heated for 15 hours at steam bath temperatures. Excess acid is removed in a rotary evaporator and the syrupy residue is diluted with 25 ml. of water. The solution is neutralized with aqueous 50% sodium hydroxide and 30 ml. of aqueous 50% CsF is added. The precipitate is separated and crystallized repeatedly to obtain $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OC}_2\text{H}_5$. A second product isolated from the reaction mixture is $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OH}$.

(E) Acetaldehyde (25 ml.) is cooled in an ice bath and 5 g. of crystalline hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ is added with stirring. An exothermic reaction sets in and subsides in a short time. Aqueous 50% CsF solution (10 ml.) is added to the mixture and the precipitate which forms is processed as described in Example 11 Part B to obtain the diethoxy-substituted derivative.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{10}(\text{OC}_2\text{H}_5)_2$ (percent): Cs, 53.5; B, 26.2; C, 9.7; H, 4.0. Found (percent): Cs, 49.1; B, 29.3; C, 8.1; H, 4.4.

EXAMPLE 13

(A) A mixture of 2.0 g. of crystalline hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ (N.E., 174) and 10 ml. of n-propyl alcohol is heated in a pressure vessel under autogenous pressure at steam bath temperature (90 – 100°C .) for 15 hours. The vessel is cooled to about -196°C . and it is opened. Volatile products which are collected are hydrogen and, by warming to 0°C ., propane. The liquid residue is mixed with aqueous 50% CsF solution and the $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OCH}_2\text{CH}_2\text{CH}_3$ (3.7 g.) which precipitates is purified by processes described earlier.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OC}_3\text{H}_7$ (percent): B, 27.8; C, 7.7; H, 3.9. Found (percent): B, 27.5; C, 7.8; H, 4.1.

(B) A solution of 28 g. of crystalline hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ (N.E., 160) is 100 ml. of isopropyl alcohol is allowed to stand 18–20 hours at about 25°C . The solution is then refluxed at steam bath temperature for about 100 hours. It is neutralized with 50% aqueous NaOH solution and 60 g. of aqueous 50% CsF solution is added. The precipitate is separated and crystallized from water to yield 33.6 g. of $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OCH}(\text{CH}_3)_2$. The infrared absorption spectrum of the compounds shows a broad peak with three fingers at 8.55, 8.70, and 8.95 μ , a large peak at 9.6 μ with a shoulder at 9.4 μ , small peaks at 10.5 and 11.1 μ and a very small peak at 12 μ .

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OCH}(\text{CH}_3)_2$ (percent): Cs, 57.0; B, 27.8; C, 7.7; H, 3.9. Found (percent): Cs, 55.4; B, 29.0; C, 7.1; H, 3.6.

The reaction is repeated employing 26.4 g. of hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ (N.E., 163) and 100 ml. of isopropyl alcohol. The mixture is refluxed 98 hours, neutralized with 50% NaOH solution, evaporated and mixed with a solution of 40 g. of $(\text{CH}_3)_4\text{NCl}$ in 20 ml. of water. The precipitate is separated and dried at 100°C . in vacuo to yield 44 g. of the bis(tetramethylammonium) salt.

Analysis.—Calc'd for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{11}\text{OCH}(\text{CH}_3)_2$ (percent): B, 37.3; C, 38.0; H, 12.1; N, 8.0. Found (percent): B, 37.8; C, 32.6; H, 11.3; N, 6.6.

(C) A mixture consisting of 11 g. of di(tetrabutyl)peroxide and 2 g. of $\text{Na}_2\text{B}_{12}\text{H}_{12} \cdot 2\text{H}_2\text{O}$ is heated in an oil bath at 105°C . for 18 hours. The disodium salt does not dissolve appreciably in the liquid. The reaction mixture is dissolved in water and aqueous 50% CsF solution is added. The precipitate is separated, washed and redissolved in water from which it is again crystallized. These crystals are $\text{Cs}_2\text{B}_{12}\text{H}_{12}$. The mother liquor from this crystallization is concentrated and more crystals separate. These crystals, obtained in low yield, are $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OC}(\text{CH}_3)_3$. The infrared spectrum of this compound shows strong absorption in the 8.5–8.9 μ wavelengths.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OC}(\text{CH}_3)_3$ (percent): C, 10.0; H, 4.2. Found (percent): C, 9.2; H, 4.5.

(D) A pressure vessel is charged with 2 g. of a hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$ (N.E., 174) and 10 ml. of 2,2,2-trifluoroethanol. The mixture is heated under autogenous pressure for 15 hours at 100°C . The reaction mixture is processed as described in Part B to obtain 3.4 g. of dicesium (2,2,2-trifluoroethoxy) undecafluorododecaborate(2-). The compound is recrystallized from solution is 3.3 ml. of hot water to obtain 2.0 g. of pure product. The identity of the compound is confirmed by its infrared absorption spectrum. It has the formula $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OCH}_2\text{CF}_3$.

(E) The reaction described in Part D is repeated employing 2 g. of the hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$ and 10 ml. of 2H-hexafluoropropanol-2. There is obtained 2.2 g. of dicesium 2H-hexafluoroisopropoxyundecafluorododecaborate(2-). The compound is crystallized from water and it has the formula $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OCH}(\text{CF}_3)_2$.

EXAMPLE 14

(A) A mixture of 2.0 g. of hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ (N.E., 174) and 10 ml. of $n\text{-C}_4\text{H}_9\text{OH}$ is heated in a pressure vessel under autogenous pressure at steam bath temperature for 15 hours. The vessel is cooled to -196°C . and opened. Volatile products obtained are hydrogen and, on warming to 0°C ., $n\text{-butane}$. The liquid residue is mixed with 5 ml. of aqueous 50% CsF solution and the precipitate which forms is processed as described in previous examples to obtain 3.6 g. of $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{X}$, where X is $-\text{OCH}_2\text{CH}_2\text{CH}_2\text{CH}_3$.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OC}_4\text{H}_9$ (percent): B, 27.1; C, 10.0; H, 4.2. Found: B, 26.9; C, 9.8; H, 4.3.

(B) A mixture of 210 g. of hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ (N.E., 174) and 10 ml. of $(n\text{-C}_4\text{H}_9)_2\text{O}$ is heated and processed as described in Part A. The product obtained is $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OC}_4\text{H}_9$ with $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OH}$ as a by-product.

EXAMPLE 15

(A) A portion (5 g.) of crystalline hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ is added slowly to 15 ml. of diethyl ketone. The temperature of the reaction mixture is maintained at $20\text{--}25^\circ\text{C}$. during this step. When addition is complete, the mixture is stirred and 10 ml. of aqueous CsF solution is added. The precipitate is separated and purified

as described earlier to obtain 4.7 g. of the compound $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{X}$, Where X is $-\text{OCH}(\text{C}_2\text{H}_5)_2$.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OC}_5\text{H}_{11}$ (percent): Cs, 53.8; B, 26.3; H, 4.5. Found (percent): Cs, 57.2; B, 27.1; H, 3.9.

(B) The procedure of Part A is repeated employing 5 g. of crystalline hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ and 15 ml. of cyclohexanone. The product obtained consists of 4.9 g. of dicesium cyclohexyloxyundecahydrododecaborate(2⁻).

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OC}_6\text{H}_{11}$ (percent): Cs, 52.5; B, 25.6; H, 4.3. Found (percent): Cs, 54.3; B, 24.5; H, 3.8.

EXAMPLE 16

(A) Crystalline hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ (10.0 g.) and 150 ml. of 1,2-dimethoxyethane are stirred to form a solution. Ethyl acetoacetate (7.23 g.) is added to the solution and the mixture is stirred for 17 hours at about 25° C. The solution is evaporated and the oil which remains is dissolved in 50 ml. of water. The solution is made basic with 20 g. of $(\text{CH}_3)_4\text{NOH}$ and the solution is poured into a large excess of ethyl alcohol. The alcohol solution is evaporated to dryness and the remaining white solid is crystallized from a 20:1 mixture of CH_3OH and water. The product is $[(\text{CH}_3)_4\text{N}]\text{B}_{12}\text{H}_{11}\text{OCH}_2\text{CH}_2\text{OCH}_3$. Reaction in the process occurs between $\text{H}_2\text{B}_{12}\text{H}_{12}$ and 1,2-dimethoxyethane.

The infrared spectrum of the compound shows absorption at the following characteristic wavelengths (expressed as microns): 4.1, very strong; 6.8, strong; 7.1, shoulder; 7.4, shoulder; 7.8, medium; 8.1, weak; 8.5, shoulder; 8.65, shoulder; 9.0, strong; 9.35, strong; 9.6, shoulder; 9.8, strong; 10.55, strong; 10.8, shoulder; 11.5, weak; 11.6, weak; 11.8, weak; 13.4, very weak; 13.9, strong.

Analysis.—Calc'd for $[(\text{CH}_3)_4\text{N}]\text{B}_{12}\text{H}_{11}\text{OCH}_2\text{CH}_2\text{OCH}_3$ percent: B, 35.64; N, 7.69; C, 36.26; H, 11.62. Found (percent): B, 36.61; N, 7.48, 7.64; C, 35.85; H, 11.57, 11.81.

(B) A solution consisting of 6.34 g. of hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ in 100 ml. of 1,2-dimethoxyethane is stirred at about 25° C. for 96 hours and at 80° C. for 12 hours. The clear solution is evaporated to dryness in a rotary evaporator, the residue is dissolved in 50 ml. of water and 9.0 g. of CsF is added to the solution. The precipitate which forms is crystallized from aqueous ethanol to obtain dicesium bis(2-methoxyethoxy)decahydrododecaborate(2⁻) as a white solid.

The infrared spectrum of the compound shows absorption at the following characteristic wavelengths (expressed as microns): 2.8, weak; 4.1, very strong; 6.2, weak; 7.2, very weak; 7.4, medium; 7.5, very weak; 7.85, weak; 8.1, weak; 8.35, shoulder; 8.5, shoulder; 8.65, strong; 9.0, strong; 9.4, strong; 9.75, strong; 10.05, medium; 10.8, weak; 11.3, weak; 11.65, weak; 11.9, weak; 13.7, broad.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{10}(\text{OCH}_2\text{CH}_2\text{OCH}_3)_2$ (percent): Cs, 46.32; B, 22.62; C, 12.56; H, 4.57. Found (percent): Cs, 45.20; B, 22.77; C, 12.96; H, 4.59.

(C) A mixture consisting of 10 g. of hydrated crystalline $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_{12}$ and 40 ml. of $\text{HOCH}_2\text{CH}_2\text{Cl}$ is heated at steam bath temperatures (90–100° C.) for 20 hours. The mixture is cooled and concentrated by evaporation (employing a Rinko unit). The residue is neutralized with aqueous cesium hydroxide solution and the cesium salt which precipitates is separated. It is recrystallized from water to obtain $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OCH}_2\text{CH}_2\text{Cl}$.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OCH}_2\text{CH}_2\text{Cl}$ (percent): Cl, 7.8; C, 4.9; H, 3.1. Found (percent): Cl, 8.1; C, 4.5; H, 3.1.

EXAMPLE 17

(A) A solution of 2.9 g. (0.013 mole) of $\text{Na}_2\text{B}_{12}\text{H}_{12} \cdot 2\text{H}_2\text{O}$ in 10 ml. of water is passed through a column filled with a commercial acid ion-exchange resin. The aqueous effluent, which is a solution of $\text{H}_2\text{B}_{12}\text{H}_{12}$, or written in the hydronium form $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_{12}$, is evaporated under reduced pressure at less than 25° C. to obtain a solid residue. The residue is dissolved in 20 ml. of 1,2-dimethoxyethane (glyme), the solution is cooled in an ice bath, and a solution of 2.4 g. of

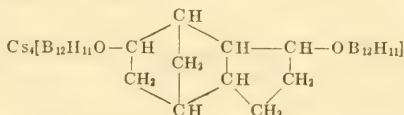
epichlorohydrin (0.026 mole) is added to it dropwise. The solvent is then removed under reduced pressure and the residue is dissolved in ethanol. To this solution there is added a solution of 3.9 g. (0.026 mole) of CsF in 10 ml. of a 1:1 mixture of absolute ethanol and glyme. The precipitate which forms is separated, washed and dried to obtain a compound of Formula 1 bearing a chloropropoxy and a methoxyethoxy substituent.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{10}(\text{OCH}_2\text{CH}_2\text{CH}_2\text{Cl})(\text{OCH}_2\text{CH}_2\text{OCH}_3)$ (percent): C, 12.5; H, 4.0; B, 22.7; Cl, 6.2. Found (percent): C, 11.27; H, 3.86; B, 20.67; Cl, 6.67.

(B) The procedure of Part A is repeated employing styrene oxide as the oxirane reactant. The product which is obtained is $\text{Cs}_2\text{B}_{12}\text{H}_{10}(\text{OCH}_2\text{CH}_2\text{C}_6\text{H}_5)_2$.

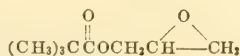
Analysis.—Calc'd for above compound (percent): C, 29.6; H, 4.5; B, 20.0. Found (percent): C, 27.22; H, 4.70; B, 18.49.

(C) The procedure of Part A is repeated employing dicyclopentadiene dioxide as the reactant. The product which is obtained is a tetracesium salt of the formula,



This compound can be viewed as a product of Formula 1 in which the X group carries a negative charge of -2 (inherent in the second $\text{B}_{12}\text{H}_{11}$ cage) and two of the four cesium ions are, therefore, part of the X group.

(D) Employing the process of Part A up to the addition of CsF, an oxirane of the formula



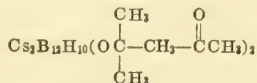
is reacted with $\text{H}_2\text{B}_{12}\text{H}_{12}$ to obtain



in solution. The compound is hydrolyzed in acid solution by conventional methods to obtain a solution of $\text{H}_2\text{B}_{12}\text{H}_{10}[\text{OCH}_2\text{CH}_2\text{CH}_2\text{OH}]_2$. This solution is mixed with an aqueous solution of CsF to obtain $\text{Cs}_2\text{B}_{12}\text{H}_{10}[\text{OCH}_2\text{CH}_2\text{CH}_2\text{OH}]_2$. The product is purified as described in Part A.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{10}[\text{OCH}_2\text{CH}_2\text{CH}_2\text{OH}]_2$ (percent): C, 7.5; H, 3.7; B, 27.0. Found (percent): C, 9.05; H, 3.79; B, 22.87.

(E) A solution of 22.4 g. of $\text{Na}_2\text{B}_{12}\text{H}_{12} \cdot 2\text{H}_2\text{O}$ (0.1 mole) in 40 ml. of water is passed through a column filled with an acid ion-exchange resin. The effluent is evaporated under reduced pressure at 20°C . to obtain a hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$ as a solid residue. The hydrated acid is dissolved in 60 ml. of glyme and 22.8 g. (0.2 mole) of 3,4-epoxy-4-methyl-2-pentanone is added dropwise and with stirring. The solvent (glyme) is evaporated from the reaction mixture under reduced pressure to obtain the solvated acid $\text{H}_2\text{B}_{12}\text{H}_{10}[\text{OC}(\text{CH}_3)_2\text{CH}_2\text{C}(\text{O})\text{CH}_3]_2$. A solution of 30.4 g. (0.2 mole) of CsF in 30 ml. of ethanol is added to the residue and the precipitate which forms is separated and recrystallized from ethanol-water mixture to obtain a compound of the formula



By employing the procedure of Example 17, hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ is reacted with the oxiranes shown in Table I at the indicated temperature to obtain, as cesium salts, the products shown in the last column of the table:

TABLE I

Oxirane	Tem- pera- ture, ° C.	Product
3,4-epoxycyclohexane carbonitrile.....	<30	$\text{C}_{52}\text{B}_{12}\text{H}_{10} \left[\begin{array}{c} \text{CH}_2 \\ \text{O}-\text{CH} \quad \text{CH}_2 \\ \quad \quad \\ \text{H}_2\text{C} \quad \text{CH}_2 \\ \quad \quad \\ \text{CH} \\ \\ \text{CN} \end{array} \right]_2$
3,4-epoxy-tetrahydrothiophene-1,1-dioxide.	<30	$\text{C}_{52}\text{B}_{12}\text{H}_{10} \left[\begin{array}{c} \text{O}-\text{CH} \quad \text{CH}_2 \\ \quad \quad \\ \text{H}_2\text{C} \quad \text{CH}_2 \\ \quad \quad \\ \text{SO}_2 \end{array} \right]_2$
1,2-epoxy-3-phenoxypropane.....	<30	$\text{C}_{52}\text{B}_{12}\text{H}_{10} (\text{OCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{OC}_6\text{H}_5)_2$
Dipentene monoxide.....	<0	$\text{C}_{52}\text{B}_{12}\text{H}_{10} \left[\begin{array}{c} \text{CH}_3 \\ \\ \text{CH} \\ \quad \quad \\ \text{O}-\text{HC} \quad \text{CH}_2 \\ \quad \quad \\ \text{H}_2\text{C} \quad \text{CH}_2 \\ \quad \quad \\ \text{CH} \\ \\ \text{C} \\ \\ \text{H}_3\text{C} \quad \text{CH}_2 \end{array} \right]_2$
1,2-epoxy-3-(4-chlorophenoxy)propane.....	<30	$\text{C}_{52}\text{B}_{12}\text{H}_{10} (\text{OCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{OC}_6\text{H}_4\text{Cl})_2$
1,2-epoxy-3-methoxypropane.....	<30	$\text{C}_{52}\text{B}_{12}\text{H}_{10} (\text{OCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{OCH}_3)_2$
Methyl phenylglycidate.....	<30	$\text{C}_{52}\text{B}_{12}\text{H}_{10} (\text{OCHCH}_2\text{CH}_2\text{OC}_6\text{H}_5)_2$ CO_2CH_3
$\begin{array}{c} \text{O} \\ \diagup \quad \diagdown \\ \text{CH}_3\text{CH} \quad \text{CH}_2 \end{array}$	30	$\text{C}_{52}\text{B}_{12}\text{H}_{10} (\text{OC}_6\text{H}_5)_2$
$\begin{array}{c} \text{CH} \\ / \quad \backslash \\ \text{HO} \quad \text{CH} \\ \quad \quad \\ \text{O} \quad \text{CH}_2 \\ \quad \quad \\ \text{HC} \quad \text{CH} \\ \quad \quad \\ \text{CH} \quad \text{CH}_2 \end{array} \quad \begin{array}{c} \text{O} \\ \\ \text{CH}-\text{CH}-\text{CO}_2\text{C}_2\text{H}_5 \end{array}$	30	$\text{C}_{52}\text{B}_{12}\text{H}_{10} \left[\begin{array}{c} \text{H} \quad \text{CH} \\ \quad \quad \\ \text{O}-\text{C} \quad \text{CH} \\ \quad \quad \\ \text{H}_2\text{C} \quad \text{CH}_2 \\ \quad \quad \\ \text{CH} \quad \text{CH}_2 \\ \quad \quad \\ \text{CH} \quad \text{CH}_2 \end{array} \quad \begin{array}{c} \text{O} \\ \\ \text{CH}-\text{CH}-\text{CO}_2\text{C}_2\text{H}_5 \end{array} \right]_2$
$\text{CH}_3(\text{CH}_2)_9\text{CH} \begin{array}{c} \text{O} \\ \diagup \quad \diagdown \\ \text{CH} \quad \text{CH}_2 \end{array}$	55	$\text{C}_{52}\text{B}_{12}\text{H}_{10} [\text{O}(\text{C}_6\text{H}_5)_{11}\text{CH}_3]_2$

Examples 11-17, inclusive, illustrate compounds of the invention in which X is an —OR group and their preparation. The processes which employ, as one reactant, an acid of a polyhydridodecaborate and, as a second reactant, a member of the group consisting of aldehydes, ketones, alcohols, ethers, and oxiranes, are generic to the preparation of compounds bearing —OR groups. Optionally, in the process for preparing compounds having —OCH₃ groups, formic acid can be used in place of formaldehyde. The generic process is illustrated further as follows: H₂B₁₂H₁₂ can be reacted with butyraldehyde to yield H₂B₁₂H₁₁OC₄H₉, with diethyl ether to yield H₂B₁₂H₁₀(OC₂H₅)₂, with 2,2'-dichlorodiethyl ether to yield H₂B₁₂H₁₁OCH₂CH₂Cl, and with 2-phenylethanol to yield H₂B₁₂H₁₁OCH₂CH₂C₆H₅. Dodecaborates which bear other substituents can be employed as reactants. To illustrate, H₂B₁₂H₁₀(SO₂C₆H₅)₂ can be reacted with dipropyl ether to yield H₂B₁₂H₈(OC₃H₇)₂(SO₂C₆H₅)₂; H₂B₁₂H₁₁C₆H₁₁ can be reacted with heptyl alcohol to yield H₂B₁₂H₁₀(C₆H₁₁)(OC₇H₁₅); H₂B₁₂H₁₁CH(CH₃)₂ can be reacted with 1,2-dimethoxyethane to yield H₂B₁₂H₁₀CH(CH₃)₂(OCH₂CH₂OCH₃)₂; H₂B₁₂H₁₀(SC₂H₅)₂ can be reacted with diethyl ether to yield H₂B₁₂H₈(SC₂H₅)₂(OC₂H₅)₂; and

$\text{H}_2\text{B}_{12}\text{H}_4\text{Cl}_7\text{CH}(\text{CH}_3)_2$ can be reacted with 1,2-diethoxyethane to yield $\text{H}_2\text{B}_{12}\text{H}_3\text{Cl}_7[\text{CH}(\text{CH}_3)_2](\text{OCH}_2\text{CH}_2\text{OC}_2\text{H}_5)$. The dodecaborate acids are customarily neutralized with bases and the compounds are isolated as salts.

EXAMPLE 18

(A) A mixture of 10 g. of crystalline hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ and 20 g. of CH_3SSCH_3 is stirred at 25–35° C. until it becomes homogeneous (ca. 0.5 hour). It is then stirred an additional 18 hours at prevailing atmospheric temperature (ca. 25° C.). Methyl mercaptan is evolved in the process and the mercaptan is preferably collected in a cooled trap. The reaction mixture is neutralized with aqueous 10% NaOH solution and the resulting solution is steam distilled to remove the last portions of methyl mercaptan. The liquid is evaporated to a mushy solid which is mixed with aqueous 50% CsF solution. The precipitated material is crystallized repeatedly from water to form two main fractions which are $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{SCH}_3$ (referred to as Fraction 1) and $\text{Cs}_2\text{B}_{12}\text{H}_{10}(\text{SCH}_3)_2$ (referred to as Fraction 2).

The infrared spectrum of Fraction 1 shows characterizing absorption bands (wavelengths expressed as microns) at 4, 9.3, 10.2, 10.4, 11.5, 11.8, and 12.1. The infrared spectrum for Fraction 2 is similar although there are intensity differences. In perchlorobutadiene mulls, the infrared spectra of both fractions showed a characterizing band at 3.4μ (saturated C—H).

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{SCH}_3$ (percent): C, 2.70; H, 3.1. Found (percent): C, 3.12; H, 3.60. Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{10}(\text{SCH}_3)_2$ (percent): C, 4.80; H, 3.20; S, 12.8. Found (percent): C, 4.29; H, 3.36; S, 10.06.

(B) The reaction of Part A is repeated except that the mixture is heated 8 hours at 35° C. and it is then allowed to stand about 18 hours at atmospheric temperature with nitrogen gas bubbling through it. The mixture is processed as described in Part A. The disubstituted compound $\text{Cs}_2\text{B}_{12}\text{H}_{10}(\text{SCH}_3)_2$ which is more soluble than the monosubstituted compound, is obtained in larger amount. *Analysis:* C, 4.83; H, 3.65; S, 13.53; B, 25.20.

Example 18 illustrates the compounds of Formula 1 in which X is a —SR group. The process described is generic to the preparation of these compounds and it can be employed to prepare a wide range of compounds by use of the appropriate disulfide reactant. To illustrate, $\text{H}_2\text{B}_{12}\text{H}_{12}$ can be reacted with dibenzyl disulfide to yield $\text{H}_2\text{B}_{12}\text{H}_{10}(\text{SCH}_2\text{C}_6\text{H}_5)_2$, with dioctyl disulfide to yield $\text{H}_2\text{B}_{12}\text{H}_{11}\text{SC}_8\text{H}_{17}$ and with diallyl disulfide to yield $\text{H}_2\text{B}_{12}\text{H}_{10}(\text{SC}_3\text{H}_5)_2$. Substituted dodecaborates can be employed as reactants as described for other procedures. For example, dimethyl disulfide can be reacted with $\text{H}_2\text{B}_{12}\text{H}_{11}\text{C}_6\text{H}_{11}$ to yield $\text{H}_2\text{B}_{12}\text{H}_6\text{C}_6\text{H}_{11}(\text{SCR})_2$ with $\text{H}_2\text{B}_{12}\text{H}_8\text{F}_4$ to obtain $\text{H}_2\text{B}_{12}\text{H}_7\text{F}_4(\text{SCH}_3)$, with $\text{H}_2\text{B}_{12}\text{H}_6(\text{C}_{10}\text{H}_{21})_6$ to yield $\text{H}_2\text{B}_{12}\text{H}_4(\text{C}_{10}\text{H}_{21})_6(\text{SCH}_3)_2$. Any disulfide can be employed in the process and dimethyl disulfide is used above solely by way of illustration. The dodecaborate acids are customarily converted to salts, as described earlier.

EXAMPLE 19

(A) A reaction vessel is charged with a mixture of 18 g. of the crystalline hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$ and 12 g. of benzenesulfonyl chloride. Nitrogen is bubbled through the mixture to provide agitation. Within a few minutes an exothermic reaction sets in and the mixture forms a uniformly soft solid. The reaction mixture is neutralized with an aqueous solution of CsOH and the precipitate which forms is separated. The precipitate is boiled with water and the mixture of solid and liquid is filtered. The filtrate is cooled and the crystals which form are collected. The crystals are a mixture of about 30% of $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{SO}_2\text{C}_6\text{H}_5$ and 70% of $\text{Cs}_2\text{B}_{12}\text{H}_{10}(\text{SO}_2\text{C}_6\text{H}_5)_2$. The infrared absorption spectrum of a Nujol mull of the product shows the following characteristic bands (expressed as microns): 4.0, 6.3, 7.6, 8.5, 8.9, 9.3, 9.7, 9.9, 10.4, 12.6, and 13.7.

Analysis.—Calc'd for the above mixture (percent): C, 15.90; H, 2.90; S, 7.05. Found (percent): C, 15.56; H, 3.53; S, 7.01.

(B) A mixture consisting of 20 g. of benzenesulfonyl chloride and 10 g. of hydrated crystalline $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_{12}$ is stirred at 35° C. for 24 hours in a current of nitrogen. The reaction mixture is processed as described in Part A and the product, which is recrystallized three or four times from water, is substantially pure $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{SO}_2\text{C}_6\text{H}_5$.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{SO}_2\text{C}_6\text{H}_5$ (percent): S, 5.8; C, 13.1; H, 2.9; B, 23.6. Found (percent): S, 5.7; C, 13.3; H, 3.8; B, 24.3.

Example 19 illustrates compounds of the invention in which the substituent is an RSO_2^- group. The process is generic to the preparation of this class of compounds. It employs as one reactant a sulfonyl halide (preferably a chloride) and, as the second reactant, a dodecaborate acid, i.e., $\text{H}_2\text{B}_{12}\text{H}_{12}$ or derivatives thereof having substituents bonded to boron. The process proceeds readily and heating is not required, although heat can be applied if needed to speed the process. It can be used to prepare a wide range of compounds by appropriate choice of reactants. Table II which follows illustrates products (shown in column 3) which can be obtained by reacting $\text{H}_2\text{B}_{12}\text{H}_{12}$ with the sulfonyl chlorides shown in column 1, employing the reaction conditions of Example 19. A reagent to supply an appropriate cation is shown in column 2.

TABLE II

Sulfonyl chloride	Cation reactant	Product
Cyclohexylbenzene- SO_2Cl	NaOH_2	$\text{Na}_2\text{B}_{12}\text{H}_{11}\text{SO}_2\text{C}_6\text{H}_{11}$
Diphenyl SO_2Cl	Pyridine	$(\text{C}_5\text{H}_5\text{NH})_2\text{B}_{12}\text{H}_{11}\text{SO}_2\text{C}_6\text{H}_5$
Naphthalene- SO_2Cl	Aniline	$(\text{C}_6\text{H}_5\text{NH}_2)_2\text{B}_{12}\text{H}_{10}(\text{SO}_2\text{C}_{11}\text{H}_2)_2$
Anthracene- SO_2Cl	$(\text{CH}_3)_4\text{NOH}$	$[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{10}(\text{SO}_2\text{C}_{11}\text{H}_2)_2$
Phenanthrene- SO_2Cl	CsOH	$\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{SO}_2\text{C}_{11}\text{H}_2$
$\text{C}_4\text{H}_9\text{SO}_2\text{Cl}$	TiOH	$\text{Ti}_2\text{B}_{12}\text{H}_{10}(\text{SO}_2\text{C}_4\text{H}_9)_2$
$\text{C}_{12}\text{H}_{25}\text{SO}_2\text{Cl}$	$(\text{CH}_3)_3\text{SOH}$	$[(\text{CH}_3)_3\text{S}]_2\text{B}_{12}\text{H}_{11}\text{SO}_2\text{C}_{11}\text{H}_{25}$
Cyclohexane- SO_2Cl	$(\text{C}_2\text{H}_5)_4\text{POH}$	$[(\text{C}_2\text{H}_5)_4\text{P}]_2\text{B}_{12}\text{H}_{12}(\text{SO}_2\text{C}_{10}\text{H}_{10})_2$
Decahydronaphthalene- SO_2Cl		$\text{Zn}(\text{NH}_3)_4\text{B}_{12}\text{H}_{11}\text{SO}_2\text{C}_{10}\text{H}_{10}$

The free acids are, of course, obtained in the process prior to the neutralization step and the acids can, if desired, be isolated directly. To illustrate briefly, $\text{H}_2\text{B}_{12}\text{H}_{10}(\text{SO}_2\text{C}_6\text{H}_4\text{CH}_3)_2$ can be obtained from $\text{H}_2\text{B}_{12}\text{H}_{12}$ and $\text{CH}_3\text{C}_6\text{H}_4\text{SO}_2\text{Cl}$; $\text{H}_2\text{B}_{12}\text{H}_{11}(\text{SO}_2\text{C}_6\text{H}_4\text{OC}_6\text{H}_5)$ can be obtained from $\text{H}_2\text{B}_{12}\text{H}_{12}$ and $\text{C}_6\text{H}_5\text{OC}_6\text{H}_4\text{SO}_2\text{Cl}$; $\text{H}_2\text{B}_{12}\text{H}_9(\text{C}_6\text{H}_{11})[\text{SO}_2\text{C}_6\text{H}_3(\text{CH}_3)_2]$ can be obtained from $\text{H}_2\text{B}_{12}\text{H}_{11}\text{C}_6\text{H}_{11}$ and $(\text{CH}_3)_2\text{C}_6\text{H}_3\text{SO}_2\text{Cl}$ and the like.

Compounds of Formula 1 in which one or more X groups are carbacyl $[\text{RC}(\text{O})-]$ are obtained conveniently by (1) reaction of $\text{B}_{12}\text{H}_{10}\cdot 2\text{CO}$ or $\text{B}_{12}\text{H}_{10}-m\text{Xm}\cdot 2\text{CO}$ (where X is defined as in Formula 1 and m is 1-10) with substituted aryl compounds as described and illustrated in Example 42, or (2) reaction of $\text{B}_{12}\text{H}_{10}\cdot 2\text{CO}$ with organomercurials as described in Examples 43-44.

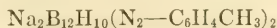
EXAMPLE 20

(A) A solution of 4.4 g. of p-methoxybenzenediazonium tetrafluoroborate is prepared in 50 ml. of water and it is filtered to remove insoluble material. The filtrate is cooled in an ice bath and a solution of 1.0 g. of the monohydrate of disodium dodecahydrododecaborate is added with stirring. A heavy white precipitate forms which is separated by filtration. A portion of the precipitated material is dried on a porous plate and its infrared absorption spectrum is determined. The infrared spectrum shows the characteristic B—H and B_{12} skeletal bands at 4.0μ and 9.4μ , a band at 4.4μ which is due to the diazonium function and bands at 6.3μ , 9.1μ , and 11.9μ , which are due to the aromatic system. The compound is bis(p-methoxybenzenediazonium) dodecahydrododecaborate(2^-), i.e., a salt of the formula $(\text{p-CH}_3\text{OC}_6\text{H}_4\text{N}_2)_2\text{B}_{12}\text{H}_{12}$. The salt is dried at 25°C . and 0.02 mm. for 20 hours. When placed on a metal block and struck with a hammer, it detonates with a flash of light and forms much black ash. It also detonates in a combustion chamber used for elemental analysis.

Analysis.—Calc'd for $\text{C}_{14}\text{H}_{26}\text{B}_{12}\text{N}_4\text{O}_2$ (percent): C, 40.79; H, 6.36. Found (percent): C, 38.86; H, 6.26.

(B) A suspension of the diazonium salt obtained in Part A in 2 ml. of ethanol is warmed on a steam bath to form a violet solution. The solution is evaporated to yield a tacky, purple solid which is slightly soluble in water to form a strongly acid solution. The compound is the dihydrate of dihydrogen bis(p-methoxyphenylazo)-decahydrododecaborate(2^-), i.e., $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_{10}(\text{N}_2-\text{C}_6\text{H}_4\text{OCH}_3)_2$. The identity of the compound is confirmed by its infrared absorption spectrum which shows bands at 3.2μ , 6.25μ , 4.0μ , and 9.25μ .

Example 20 illustrates compounds of Formula 1 in which X is an arylazo group, i.e., $\text{ArN}=\text{N}-$, and a method for their preparation. The process is generic to the preparation of this class of compounds and it is usually conducted in two steps. In the first step an aryldiazonium salt of $\text{B}_{12}\text{H}_{12}^{2-}$ is prepared and, in the second step, the salt is rearranged to form the arylazosubstituted dodecaborate acid. A wide range of products can be obtained by employing the appropriate diazonium tetrafluoroborate and the appropriate dodecaborate which can contain substituents. By way of illustration, the following compounds can be obtained: $\text{H}_2\text{B}_{12}\text{H}_{11}(\text{N}_2-\text{C}_6\text{H}_5)_5$,



$\text{BaB}_{12}\text{H}_{10}[\text{N}_2\text{C}_6\text{H}_3(\text{CH}_3)_2]_2$, $\text{CaB}_{12}\text{H}_6\text{F}_4(\text{N}_2\text{C}_6\text{H}_5)_2$,
 $[(\text{CH}_3)_3\text{S}]_2\text{B}_{12}\text{H}_9(\text{OCH}_3)(\text{N}_2\text{C}_6\text{H}_5\text{OCH}_3)_2$
 and the like.

EXAMPLE 21

A mixture of 25 g. of crystalline hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ and 30 g. of propylene is agitated in a pressure vessel under autogenous pressure at $24-25^\circ\text{C}$. for 2.5 days. The vessel is vented to remove unreacted propylene and the nonvolatile residue is neutralized with aqueous CsOH solution. The precipitate which forms is separated. On attempted recrystallization from water, it forms a gel which is broken by addition of methanol. The product is crystallized a second time from water to obtain pure dicesium isopropylundecahydrododecaborate(2^-).

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{CH}(\text{CH}_3)_2$ (percent): C, 8.00; H, 4.00; B, 28.8. Found (percent): C, 8.39; H, 4.35; B, 28.01.

The above process is repeated at 35°C . and at 45°C . to obtain the isopropyl-substituted dicesium salt.

EXAMPLE 22

(A) A suspension is prepared by stirring 0.3 g. of $\text{H}_2\text{B}_{12}\text{H}_{12} \cdot 2\text{H}_2\text{O}$, or $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_{12}$, in 40 ml. of 1,2-dimethoxyethane. Isobutylene is bubbled through the suspension at about 25°C . for 40 minutes at a rate of about 50 ml./minute. The temperature rises rapidly to 31°C . and remains at this point for 30 minutes. The temperature then drops to about 28°C . and the solution becomes clear. The solution is concentrated under reduced pressure to yield an oily residue which contains the free alkylated acid. The residue is dissolved in a small quantity of water and 1 ml. of aqueous 50% cesium fluoride solution is added with stirring. A white crystalline solid forms which is separated by filtration. The infrared absorption spectrum and elemental analysis show that the product is the monohydrate of cesium hydrogen tert.-butylundecahydrododecaborate(2^-), i.e., $\text{CsHB}_{12}\text{H}_{11}\text{C}(\text{CH}_3)_3 \cdot \text{H}_2\text{O}$ or, as an optional method of representation, $\text{Cs}(\text{H}_3\text{O})\text{B}_{12}\text{H}_{11}\text{C}(\text{CH}_3)_3$.

Analysis.—Calc'd for $\text{C}_4\text{H}_{23}\text{B}_{12}\text{CsO}$ (percent); C, 13.70; H, 6.57; B, 37.1. Found (percent): C, 13.75; H, 5.73; B, 34.07.

Solubility of the product in water is limited and its aqueous solution is strongly acidic, showing the presence of the hydrogen cation.

(B) A mixture of 2.5 g. of $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_{12}$ and 3.1 g. of isobutylene is charged into a pressure vessel and agitated under autogenous pressure for 2.5 days at about 25°C . A portion of the reaction mixture is processed as described in Part A to obtain $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{C}(\text{CH}_3)_3$ as a colloidal salt. A second portion is reacted with aqueous TiNO_3 solution to obtain the very insoluble $\text{Ti}_2\text{B}_{12}\text{H}_{11}\text{C}(\text{CH}_3)_3$ as a double salt with thallium nitrate.

EXAMPLE 23

A mixture of 5 g. of crystalline hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ and 25 g. of decene-1 is agitated in a pressure vessel under autogenous pressure at atmospheric temperature for 4.5 days. The mixture, which originally forms two phases, is a substantially homogeneous oil at the end of this period. It is washed with aqueous 2% NaOH solution in which the mixture is insoluble. The oily layer is dissolved in ether and washed with water. The ether solution is dried and the solvent is removed by evaporation to obtain the hydrate of dihydrogen hexa(decyl)hexahydrododecaborate(2^-) in substantially pure form. The compound is an oil at ordinary temperatures.

Analysis.—Calc'd for $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_6(\text{C}_{10}\text{H}_{21})_6$ (percent): C, 70.60; H, 13.50; B, 12.70; Found (percent): C, 69.99; H, 12.84; B, 10.85.

EXAMPLE 24

(A) An aqueous solution containing 6.1 g. of disodium polyhydropolyborate of Example A is passed through a column (1" x 40") packed with an ion-exchange resin, "Amberlite" IR-120-H, to obtain the free acid in solution. The acidic solution is evaporated under reduced pressure to yield the free acid in the form of a hydrate as a white crystalline solid.

(B) The acid hydrate of Part A is mixed with 5 ml. of cyclohexene and 5 ml. of 1,2-dimethoxyethane. The mixture is heated to boiling under a reflux condenser for 20 hours to form a colorless homogeneous solution. The solution is evaporated under reduced pressure and there is obtained a solvated dihydrogen monocyclohexylundecahydrododecaborate. The compound is a colorless, viscous liquid whose structure is confirmed by the infrared absorption spectrum and by elementary analysis to be $\text{H}_2\text{B}_{12}\text{H}_{11}(\text{C}_6\text{H}_{11}) \cdot (\text{H}_2\text{O})_5 \cdot \text{C}_4\text{H}_{10}\text{O}_2$.

Analysis.—Calc'd for $\text{C}_{10}\text{H}_{44}\text{B}_{12}\text{O}_7$ (percent): C, 29.56; B, 31.96; H, 10.92; O (by difference), 27.56. Found (percent): C, 30.73; B, 30.73; H, 8.8; O (by difference), 29.88.

(C) A portion of the acid from Part B is dissolved in 20 ml. of aqueous 5% potassium hydroxide solution. To this solution, which contains $\text{K}_2\text{B}_{12}\text{H}_{11}(\text{C}_6\text{H}_{11})$, there is added with stirring 10 ml. of aqueous 50% cesium fluoride solution. A white sticky precipitate forms which is separated by filtration and dried under reduced pressure to yield a cesium salt of a cyclohexyl-substituted polyhydropolyborate. The infrared absorption spectrum of the compound shows the characteristic bands for $\text{B}_{12}\text{H}_{12}$ anion (4.0μ and 9.3μ) and bands for cycloaliphatic C—H, methyl groups and ether functions. Data from the infrared absorption spectrum and elemental analysis show that the compound is dicesium monocyclohexylundecahydrododecaborate with 1 mole of 1,2-dimethoxyethane as solvent of crystallization, i.e., $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{C}_6\text{H}_{11} \cdot \text{CH}_3\text{OCH}_2\text{CH}_2\text{OCH}_3$.

Analysis.—Calc'd for $\text{C}_{10}\text{H}_{32}\text{B}_{12}\text{Cs}_2\text{O}_2$ (percent): C, 20.70; H, 5.70; B, 22.40. Found (percent): C, 19.71; H, 5.27; B, 20.52.

The salt is soluble in water and it forms a neutral solution, i.e., the pH of the solution is 7.

(D) A mixture of the hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$ (about 0.08 mole) and cyclohexene (0.16 mole) in 100 ml. of 1,2-dimethoxyethane is refluxed for 2 hours. The mixture is cooled to atmospheric temperature, neutralized with concentrated aqueous NaOH solution and evaporated to dryness. The solid is dissolved in tetrahydrofuran, the solution is filtered and the filtrate is again evaporated to dryness. The yellow syrup which remains is dissolved in water and the solution is steam-distilled. The aqueous solution is mixed with aqueous 50% CsF solution to precipitate $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{C}_6\text{H}_{11}$. The white solid is crystallized from water to obtain the pure product as fine white crystals.

The infrared absorption spectrum shows characteristic bands at wavelengths (expressed as microns) of 4.05, 3.45 and 6.9.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{C}_6\text{H}_{11}$ (percent): C, 14.71; H, 4.53. Found (percent): C, 14.16; H, 3.75.

EXAMPLE 25

(A) A homogeneous solution is prepared consisting of 5.0 g. of the hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$ and 5 g. of styrene in 2-propanol. The solution is held at 0–5° C. for 18 hours and at atmospheric temperature (about 25° C.) for 5 hours. The reaction mixture is neutralized with aqueous CsOH solution and the precipitate which forms is separated. It is crystallized from aqueous 50% isopropyl alcohol to obtain a product which is a mixture of compounds having from one to four $\text{C}_6\text{H}_5\text{C}_2\text{H}_4$ groups as substituents. These compounds, which are not separated by crystallization, have the formula $\text{Cs}_2\text{B}_{12}\text{H}_{12-n}(\text{C}_2\text{H}_4\text{C}_6\text{H}_5)_n$ where n is 1–4.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{10.8}(\text{C}_2\text{H}_4\text{C}_6\text{H}_5)_{3.2}$ (percent): C, 41.30; H, 5.10; B, 17.50. Found (percent): C, 41.62; H, 5.26; B, 17.56.

(B) The process of Part A is repeated employing 29 g. of the hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$ and 15 g. of styrene. There is obtained a product whose average composition is $\text{Cs}_2\text{B}_{12}\text{H}_{10.6}(\text{C}_2\text{H}_4\text{C}_6\text{H}_5)_{1.4}$.

Analysis.—Calc'd for above composition (percent): C, 24.30; H, 4.20; B, 23.40; Cs, 37.90. Found (percent): C, 24.33; H, 4.65; B, 23.34; Cs, 45.10.

(C) A reaction vessel is charged with 21 g. of 2-propanol and cooled to 0–5° C. Hydrated crystalline $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_{12}$ (12 g.) is added with stirring. The solution is maintained at 0–5° C. and 10 g. of p-chlorostyrene is added drop-wise with stirring. The reaction mixture is allowed to warm to atmospheric temperature (about

25° C.) and then heated to 35° C. for 20 hours with stirring. The solution becomes clear. It is cooled to atmospheric temperature and then poured onto a small amount of chopped ice. The mixture is neutralized with aqueous CsOH solution and the cesium salt which precipitates is separated and recrystallized from water to obtain $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{CH}(\text{CH}_3)\text{C}_6\text{H}_4\text{Cl}$. The infrared spectrum shows absorption at 2.8, 4.0, 6.3, 8.6, 8.9, 9.4, and 9.7 μ .

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{CH}(\text{CH}_3)\text{C}_6\text{H}_4\text{Cl}$ (percent): C, 17.6; H, 3.5; B, 23.8; Cl, 6.5. Found (percent): C, 15.7; H, 4.1; B, 24.9; Cl, 5.0.

Fluoroalkyl-substituted dodecaborates are obtained by reacting a dodecahydrododecaborate salt with a fluoroolefin. To illustrate, 2 g. of a trihydrate of $\text{Na}_2\text{B}_{12}\text{H}_{12}$, 10 g. of tetrafluoroethylene, 40 ml. of deoxygenated water and 0.5 g. of potassium persulfate are charged into a pressure vessel and the mixture is heated gradually from 31°–82° C. under 605–800 p.s.i. pressure for 4.5 hours. The reaction mixture thus obtained is mixed with an excess of aqueous 50% CsF solution and the precipitate which forms is separated. It is a mixture of $\text{Cs}_2\text{B}_{12}\text{H}_{12}$ (i.e., unreacted $\text{B}_{12}\text{H}_{12}^{2-}$ anion) and $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{CF}_2\text{—CF}_2\text{H}$. Elementary analysis of the mixture shows 2.42% C, 3.15% H, and 7.87% F. The infrared absorption spectrum shows characterizing bands at 4.0, 8.6, 9.0 and 9.4 μ . The fluoroalkyl-substituted compound can be obtained in pure form by repeated crystallization from hydroxylated solvents.

EXAMPLE 26

(A) A pressure vessel is charged with 5.0 g. of hydrated dihydrogen dodecahydrododecaborate, i.e., hydrated $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_{12}$, and 50 ml. of 1,2-dimethoxyethane containing a small quantity of water. The vessel is flushed with nitrogen, closed and cooled in a solid carbon dioxide bath to –80° C. Pressure in the vessel is reduced to less than 10 mm. of mercury by means of a vacuum pump and 1.8 g. (0.05 mole) of acetylene is injected into the vessel. The reaction mixture is heated with agitation under autogeneous pressure (45 p.s.i.) at 80° C. for 4 hours. The vessel is cooled to atmospheric temperature and the reaction mixture is poured into a glass container. The mixture, which is homogeneous, is evaporated under reduced pressure (20–30 mm.) at about 40° C. to yield 6.5 g. of reaction product. The infrared absorption spectrum of the product shows that it is a mixture of dihydrogen polyhydrododecaborates bearing substituents which are saturated and unsaturated hydrocarbon groups of at most 2 carbons and monooxahydrocarboxy groups of the type— $\text{OCH}_2\text{CH}_2\text{OCH}_3$. The elemental analysis is as follows: C, 26.92; H, 8.74.

(B) The acid, obtained as described in Part A, is neutralized with aqueous potassium hydroxide to form the dipotassium salt in aqueous solution. This solution is reacted with aqueous cesium fluoride to precipitate the dicesium compound which is separated by filtration. The compound is dried and its elemental analysis is as follows: C, 9.80; H, 3.97.

EXAMPLE 27

(A) A reaction vessel is charged with 5.0 g. of the hydrate of dihydrogen dodecahydrododecaborate, i.e., hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$, and 50 ml. of 1,2-dimethoxyethane containing a small quantity of water. The reaction vessel is fitted with a reflux condenser and means of introducing nitrogen to provide an inert atmosphere. Phenylacetylene (2.5 g.) is added to the reaction mixture which is then heated to mild refluxing for 1 hour in the nitrogen atmosphere. The mixture is cooled and the solvent is removed by heating the mixture under about 1 mm. pressure at 35–40° C. There is obtained 8.1 g. of a viscous residue which is shown by elemental analysis and the infrared absorption spectrum to be dihydrogen monostyrylundecahydrododecaborate dihydrate.

Analysis.—Calc'd for $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_{11}(\text{C}_2\text{H}_2\text{C}_6\text{H}_5)$ (percent): C, 34.10; H, 8.5. Found (percent): C, 34.09; H, 9.96.

(B) The product of Part A is neutralized with aqueous potassium hydroxide to form an aqueous solution of $\text{K}_2\text{B}_{12}\text{H}_{11}(\text{C}_2\text{H}_2\text{C}_6\text{H}_5)$. The solution is reacted with aqueous cesium fluoride to precipitate the dicesium salt. The salt is separated by filtration and dried. The identity of the compound, which is dicesium monostyrylundecahydrododecaborate, is confirmed by elemental analysis.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}(\text{C}_2\text{H}_2\text{C}_6\text{H}_5)$ (percent): C, 18.70; H, 3.60. Found (percent): C, 18.27; H, 3.97.

(C) A reaction vessel is charged with 4.0 g. of the crystalline hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$ and 4 g. of cold CH_3OH . The solution is chilled to 0° C. and 2 g. of phenylacetylene

is added with agitation. The mixture is maintained at 0° C. for 1 hour and then at about 25° C. for 16 hours. A portion is neutralized with CsOH solution to form the insoluble cesium salt which gels in water. A second portion is neutralized with aqueous TiOH to precipitate the very insoluble thallium salt. The thallium compound is extracted with water in a Soxhlet extractor and the product is dried to obtain $\text{Th}_2\text{B}_{12}\text{H}_{11}(\text{C}_2\text{H}_2\text{C}_6\text{H}_5)$ as a white crystalline product. The infrared absorption spectrum shows that the product contains some $\text{Th}_2\text{B}_{12}\text{H}_{11}\text{CH}(\text{CH}_3)\text{C}_6\text{H}_5$.

Analysis.—Calc'd for $\text{Th}_2\text{B}_{12}\text{H}_{11}(\text{C}_2\text{H}_2\text{C}_6\text{H}_5)$ (percent): C, 14.7; H, 2.8; B, 19.8. Found (percent): C, 14.9; H, 3.4; B, 19.2.

(D) The process of Part C is repeated, employing five times the quantities of reactants by weight. The reaction mixture is neutralized with aqueous CsOH and the gel which forms is broken up and methanol. The white crystalline product is a mixture of mono- and di-substituted dicesium polyhydrideborates having an average composition of 1.3 phenylacetylene units per dodecaborate anion e.g., 70% of $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{C}_2\text{H}_2\text{C}_6\text{H}_5$ and 30% of $\text{Cs}_2\text{B}_{12}\text{H}_{10}(\text{C}_2\text{H}_2\text{C}_6\text{H}_5)_2$.

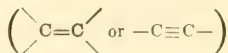
Analysis.—Calc'd for above composition (percent): C, 23.20; H, 3.70; B, 39.90. Found (percent): C, 23.51; H, 4.14; B, 22.76.

EXAMPLE 28

A reaction vessel is charged with 10 g. of the crystalline hydrate of $\text{H}_2\text{B}_{12}\text{H}_{12}$ and 11.7 g. of propiolic acid is added to it slowly over a period of 2 hours with stirring. The temperature of the reaction mass is maintained at 35–40° C. The mixture is neutralized with aqueous NaOH solution and an excess of aqueous 50% CsF solution is added. The precipitate which forms is separated and recrystallized three times from water to obtain $\text{Cs}_2\text{B}_{12}\text{H}_{11}(\text{C}_2\text{H}_2\text{COOH})$ as a white crystalline salt. The compound contains a carboxyl group which can also form a cesium salt and the compound contains a small quantity of this tricesium salt.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}(\text{C}_2\text{H}_2\text{COOH})$ (percent): Cs, 55.5; H, 2.96; C, 7.55. Found (percent): Cs, 56.7; H, 3.40; C, 4.20.

Examples 21 through 28 illustrate the compounds of Formula 1 in which X is a substituted or unsubstituted hydrocarbon group. The substituent X can be saturated or unsaturated, open-chain or cyclic. The process, which is generic to the preparation of this class of compounds, employs (1) a reactant which has olefinic or acetylenic bonds.

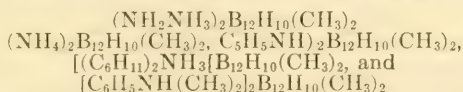


and (2) an acid of a dodecaborate which can have substituents. The unsaturated reactant preferably has at most two unsaturated bonds, i.e., at most two olefinic or two acetylenic bonds. The number of carbons in this reactant is not critical but, in general, unsaturated reactants of up to 18 carbons are preferred. Examples of compounds which can be obtained by the process are: $\text{H}_2\text{B}_{12}\text{H}_{10}(\text{C}_6\text{H}_{13})_2$ from hexene-1 and $\text{H}_2\text{B}_{12}\text{H}_{12}$, $\text{H}_2\text{B}_{12}\text{H}_{11}(\text{C}_2\text{H}_4\text{COOH})$ from acrylic acid and $\text{H}_2\text{B}_{12}\text{H}_{12}$, $\text{H}_2\text{B}_{12}\text{H}_{11}\text{C}(\text{CH}_3)_3(\text{C}_6\text{H}_{11})$ from cyclohexene and $\text{H}_2\text{B}_{12}\text{H}_{11}\text{C}(\text{CH}_3)_3$, and $\text{H}_2\text{B}_{12}\text{H}_9(\text{SCH}_3)_2[\text{CH}(\text{CH}_3)_2]$ from propylene and $\text{H}_2\text{B}_{12}\text{H}_{10}(\text{SCH}_3)_2$.

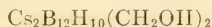
Compounds of Formula 1 in which at least one X group is alkynyl can be obtained from derivatives bearing open chain acyl groups by reaction with a halogenating agent followed by dehydrohalogenation. To illustrate $(\text{NH}_4)_2\text{B}_{12}\text{H}_{11}\text{C}(\text{O})\text{CH}_3$ can be reacted with PCl_5 to obtain $(\text{NH}_4)_2\text{B}_{12}\text{H}_{11}\text{CCl}_2\text{CH}_3$. This compound can then be dehydrohalogenated with e.g., aqueous KOH solution, to obtain $(\text{NH}_4)_2\text{B}_{12}\text{H}_{11}\text{C}\equiv\text{CH}$.

Compounds of Formula 1 in which at least one X group is methyl are obtained by treating $\text{B}_{12}\text{H}_{10}\text{2CO}$ with a reducing agent e.g., lithium aluminum hydride. To illustrate, $\text{B}_{12}\text{H}_{10}\text{2CO}$ is dissolved in diethyl ether and this solution is added slowly and with stirring to a solution of LiAlH_4 in ether. After addition is complete, the mixture is gently refluxed for a few hours and then allowed to cool. Excess LiAlH_4 is destroyed by adding ether saturated with water slowly to the solution and finally water is added. The ether layer separates and is removed by decantation. The water layer is filtered and the filtrate is acidified with hydrochloric acid. The filtrate can, if desired, be divided into separate portions. To one portion an aqueous solution of CsF can be added to precipitate $\text{Cs}_2\text{B}_{12}\text{H}_{10}(\text{CH}_3)_2$; to a second portion $(\text{C}_3\text{H}_7)_3\text{NO}_4\text{H}^4$ can be added to precipitate $[\text{C}_3\text{H}_7)_4\text{N}]_2\text{B}_{12}\text{H}_{10}(\text{CH}_3)_2$, and to a third portion TiNO_3 can be added to precipitate $\text{Th}_2\text{B}_{12}\text{H}_{10}(\text{CH}_3)_2$. The precipitated compounds can be isolated and purified by recrystallization as described in previous examples. Optionally, the acidified filtrate obtained from the reac-

tion can be subjected to further purification to obtain hydrated $H_2B_{12}H_{10}(CH_3)_2$ or it can be neutralized with a wide range of basic compounds, e.g., NH_2NH_2 , NH_4OH , pyridine, dicyclohexylamine, dimethylaniline, and the like to obtain, e.g.,



Compounds of Formula 1 in which at least one X group is hydroxymethyl can be obtained by reducing $B_{12}H_{10}CO$ with a borohydride, e.g., $LiBH_4$. To illustrate, a solution is prepared of $LiBH_4$ in 1,2-dimethoxyethane (glyme). The solution is stirred under an inert atmosphere, e.g., nitrogen, and to it there is added dropwise a solution of $B_{12}H_{10}CO$ in 1,2-dimethoxyethane. After addition is completed the mixture is refluxed gently for about 30 minutes. The mixture is cooled and the glyme is removed by evaporation or, in the event two layers are present, by decantation. The residue is dissolved in water and the solution can be divided, if desired, into several portions. These portions are mixed with a salt or base having the desired cation M to obtain salts of the anion $B_{12}H_{10}(CH_2OH)_2^{2-}$. For example, one portion can be mixed with an aqueous solution of $TiOH$ to obtain $Ti_2B_{12}H_{10}(CH_2OH)_2$, a second portion can be mixed with $RbCl$ to obtain $Rb_2B_{12}H_{10}(CH_2OH)_2$, and a third portion can be mixed with $CsCl$ to obtain



Aqueous solutions of these salts can be contacted with an acid ion-exchange resin to obtain a pure aqueous solution of $H_2B_{12}H_{10}(CH_2OH)_2$. The acid solution can be neutralized with any desired organic or inorganic base to obtain a compound of Formula 1 bearing $-CH_2OH$ groups.

The compounds described above in which at least one X is $-CH_2OH$ can be reacted with hydrohalogenic acids to obtain compounds of Formula 1 in which at least one X is CH_2Y (where Y is F, Cl, Br or I). To illustrate, $H_2B_{12}H_{10}(CH_2OH)_2$ can be reacted with HF to obtain $H_2B_{12}H_{10}(CH_2F)_2$, with HCl to obtain $H_2B_{12}H_{10}(CH_2Cl)_2$ with HBr to obtain $H_2B_{12}H_{10}(CH_2Br)_2$, and with HI to obtain $H_2B_{12}H_{10}(CH_2I)_2$. These acids can be employed, as described earlier, to prepare a wide range of salts.

Compounds bearing $-CH_2OH$ groups can be reacted with organic acids, anhydrides or acid halides to obtain products bearing $-CH_2OC(O)R$ groups, where R has the meanings defined in a previous paragraph. To illustrate, $H_2B_{12}H_{10}(CH_2OH)_2$ can be reacted with acetic anhydride to obtain $H_2B_{12}H_{10}[CH_2OC(O)CH_3]_2$, with benzoyl chloride to obtain $H_2B_{12}H_{10}[CH_2OC(O)C_6H_5]_2$, with methacrylic anhydride to obtain $H_2B_{12}H_{10}[CH_2OC(O)C(CH_3)=CH]_2$ and the like.

EXAMPLE 29

(A) A quantity (20 g.) of $[(CH_3)_4N]_2B_{12}H_{11}OH$, obtained as described in Example 8, Part D, is mixed with 50 ml. of water. The mixture is heated to refluxing and chlorine gas is passed into it for 40 minutes. The mixture is cooled and the precipitate is separated. It is recrystallized from 50% aqueous CH_3CN to obtain 18 g. of a pentachloromonohydroxy derivative.

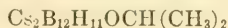
Analysis.—Calc'd for $[(CH_3)_4N]_2B_{12}H_6Cl_5OH$ (percent): C, 19.9; H, 6.; 5Cl, 37.0; N, 5.8. Found (percent): C, 19.4; H, 6.5; Cl, 37.9; N, 5.7.

An aqueous solution of the above compound is passed through a column filled with an acid ion-exchange resin and the aqueous effluent, which contains $H_2B_{12}H_6Cl_5OH$, is neutralized with cesium hydroxide to obtain $Cs_2B_{12}H_6Cl_5OH$.

(B) Sufficient water is added to 1 g. of $Cs_2B_{12}H_{11}OH$, prepared as described in Example 8, Part C, to form a clear solution at 90° C. Chlorine gas is bubbled through the solution at this temperature for one hour. The product which is formed is sparingly soluble and water is added as needed to maintain a clear hot solution during passage of the gas. Flow of chlorine is stopped and the solution is chilled. White crystals form which are separated, recrystallized from hot water and dried. The product is the monohydrate of $Cs_2B_{12}HCl_{10}OH$.

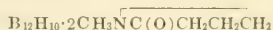
Analysis.—Calc'd for $Cs_2B_{12}HCl_{10}OH \cdot H_2O$ (percent): Cs, 33.8; B, 16.5; H, 0.5; Cl, 45.1. Found (percent): Cs, 32.5, 32.8; B, 16.5, 16.5; H, 0.7, 0.6; Cl, 45.3, 45.6.

The above process is repeated employing



of Example 13, Part B, and $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OC}_6\text{H}_{11}$ of Example 15, Part C, in place of $\text{C}_8\text{H}_7\text{B}_{12}\text{H}_{11}\text{OH}$. The product obtained with either reactant is $\text{Cs}_2\text{B}_{12}\text{HCl}_{10}\text{OH}$ as a hydrate.

(C) A reaction vessel is charged with 60 g. of



obtained as described in Example 8, Part G, and a solution of 28 g. of NaOH in 300 ml. of water. The mixture is refluxed for one hour. It is cooled and sufficient concentrated hydrochloric acid is added to form a neutral solution. The solution is heated to slow refluxing and chlorine gas is passed through it for 1.5 hours. The solution is cooled and neutralized with aqueous NaOH solution. It is stirred and 50 g. of $(\text{CH}_3)_4\text{NOH} \cdot 5\text{H}_2\text{O}$ is added. The solution is cooled in ice and the precipitate which forms is separated to obtain $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Cl}_8\text{H}_2(\text{OH})_2$. The filtrate is set aside for further processing. The compound is further purified by recrystallization from 50% aqueous acetonitrile to obtain 27 g. of product.

Analysis.—Calc'd for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Cl}_8\text{H}_2(\text{OH})_2$ (percent): C, 15.9; H, 4.7; Cl, 47.4. Found (percent): C, 16.4; H, 4.9; Cl, 46.6.

The filtrate from the above process is allowed to evaporate for two days at atmospheric temperature. Crystals form which are separated and dried to obtain 14.5 g. of $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Cl}_7\text{H}_3(\text{OH})_2$.

Analysis.—Calc'd for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Cl}_7\text{H}_3(\text{OH})_2$ (percent): C, 17.0; H, 5.1; Cl, 43.8. Found (percent): C, 17.5; H, 5.4; Cl, 43.6.

(D) An aqueous solution of $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_9(\text{OH})_3$ is prepared as described in Example 8, Part H, and it is evaporated to a volume of 200 ml. The solution is cooled to 5° C., chlorine gas is bubbled through it and the temperature is raised gradually to 95° C. Excess chlorine is then swept from the solution with a stream of nitrogen and the solution is evaporated to dryness under reduced pressure. There is obtained 57.7 g. of a gummy residue which is mixed with 55 ml. of water. The mixture is made neutral with aqueous $(\text{CH}_3)_4\text{NOH}$ solution and it is filtered. The filtrate is added to 480 ml. of absolute ethyl alcohol and a white crystalline solid precipitates which is $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Cl}_9(\text{OH})_3$. The crystals are separated, washed with absolute alcohol and dried under reduced pressure to yield 33.3 g. of product. The compound is further purified by dissolving in water and precipitating again with alcohol.

Analysis.—Calc'd for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Cl}_9(\text{OH})_3$ (percent): N, 4.32; C, 14.82; H, 4.20; B, 20.03; Cl, 49.22. Found (percent): N, 4.35, 4.19; C, 15.33; H, 4.60; B, 20.93; Cl, 49.45.

(D) A solution of 6.13 g. of $(\text{NH}_4)_2\text{B}_{12}\text{H}_9(\text{OH})_3$, prepared as described in Example 8, Part I, is chlorinated as described above to obtain the trihydroxynonachlorododecaborate salt, i.e., $(\text{NH}_4)_2\text{B}_{12}\text{Cl}_9(\text{OH})_3$.

(E) An aqueous solution of $\text{H}_2\text{B}_{12}\text{H}_8(\text{OH})_4$, prepared as described in Example 8, Part J, is warmed to 50–60° C. and chlorine gas is bubbled through it until no further absorption of the gas is observed. The reaction mixture is cooled and neutralized with NH_4OH . It is divided into two portions. One portion is mixed with an aqueous solution of $(\text{CH}_3)_4\text{NCl}$ and the second portion is mixed with an aqueous solution of $(n\text{-C}_8\text{H}_{17})_4\text{NI}$. In each case the white precipitate which forms is separated, recrystallized from water and dried. The compounds are salts of the tetrahydroxyoctachlorododecaborate anion.

Analysis.—Calc'd for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Cl}_8(\text{OH})_4$ (percent): B, 20.7; C, 15.2; H, 4.13; Cl, 45.2. Found (percent): B, 20.7; C, 15.3; H, 4.73; Cl, 46.2.

Analysis.—Calc'd for $[(\text{C}_8\text{H}_{17})_4\text{N}]_2\text{B}_{12}\text{Cl}_8(\text{OH})_4$ (percent): B, 15.2; C, 33.7; H, 7.50; Cl, 33.2. Found (percent): B, 13.3; C, 24.8; H, 6.05; Cl, 33.8.

The infrared spectrum of the tetramethylammonium salt shows characteristic absorption bands at the following wavelengths (expressed as cm^{-1}): 3600, medium; 3100, medium; 1200, medium; 1080, weak; 1025, strong, broad; 940, strong; 850, strong, broad; and 720, strong, broad.

EXAMPLE 30

(A) A mixture is prepared consisting of 20 ml. of water and 1 g. of $\text{Cs}_2\text{B}_{12}\text{H}_{11}(\text{OC}_6\text{H}_5)_2$, obtained as described in Example 13, Part B. Liquid bromine is added dropwise to the solution with stirring. The reaction is exothermic and the solution refluxes. Water is added as needed during the process to maintain a clear solution. When bromine is no longer absorbed, the solution is heated to maintain refluxing and chlorine gas is bubbled through

the solution while bromine is added dropwise for 5 minutes. The solution is then evaporated partially, filtered and the filtrate is cooled. A precipitate forms which is separated, washed with water and dried under reduced pressure to obtain 1.7 g. of $\text{Cs}_2\text{B}_{12}\text{Br}_{11}\text{OH}$.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{Br}_{11}\text{OH}$ (percent): Cs, 20.6; B, 10.1; Br, 68.0. Found (percent): Cs, 20.3; B, 9.8; Br, 68.4.

(B) Bromination of $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{11}\text{OCH}(\text{C}_2\text{H}_5)_2$, obtained as described in Example 15, is conducted as described in Part A to obtain 2.2 g. of $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Br}_{11}\text{OH}$.

Analysis.—Calc'd for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Br}_{11}\text{OH}$ (percent): B, 11.0; C, 8.2; H, 2.1; Br, 74.8. Found (percent): B, 10.9; C, 8.5; H, 2.2; Br, 74.9.

(C) Bromination of 1.0 g. of $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{11}\text{OH}$ (see Example 8, Part D), as described in Part A, yields 2.2 g. of $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Br}_{11}\text{OH}$. Similarly bromination of 2.0 g. of $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OH}$ (see Example 8, Part B) yields 2.0 g. of $\text{Cs}_2\text{B}_{12}\text{Br}_{11}\text{OH}$.

(D) A portion (5.5 g.) of product B, obtained as described in Example 8, Part G, is mixed with 30 ml. of water and 2 g. of NaOH. The mixture is refluxed for 2.5 hours and then cooled to atmospheric temperature. It is diluted with 20 ml. of water and liquid bromine is added dropwise with stirring. The reaction is exothermic and proceeds rapidly. Bromine addition is continued until the color of bromine persists for 10 minutes. The mixture is then made basic by addition of solid NaOH. Aqueous $(\text{CH}_3)_4\text{NCl}$ solution is added with stirring until precipitation of a white solid is complete. The solid is separated and crystallized from hot water to obtain 3.5 g. of white crystalline $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Br}_{10}(\text{OH})_2$.

Analysis.—Calc'd for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Br}_{10}(\text{OH})_2$ (percent): B, 11.70; C, 8.60; H, 2.30; Br, 71.80; N, 2.50. Found (percent): B, 11.82; C, 9.21, 9.02; H, 2.76, 3.03; Br, 71.60, 72.03; N, 2.47, 2.59.

(E) A solution consisting of 100 ml. of water and 10 g. of $\text{Cs}_2\text{B}_{12}\text{H}_9(\text{OH})_3$, prepared as described in Example 8, Part H, is cooled to about 8°C . Liquid bromine is added dropwise with stirring and the solution temperature is maintained at $8\text{--}32^\circ\text{C}$. until the rate of bromine absorption decreases. An excess of liquid bromine is added at this time and chlorine gas is bubbled through the solution as the temperature is raised from 32° to 83°C . When no further reaction is evident, addition of chlorine is stopped and nitrogen gas is passed into the mixture to sweep out excess chlorine and bromine. The solution is evaporated at 55°C . under reduced pressure to yield 25.12 g. of solids. The solids divided into two portions.

One portion is dissolved in water and neutralized with aqueous CsOH solution. The precipitate which forms is separated and crystallized twice from water to obtain $\text{Cs}_2\text{B}_{12}\text{Br}_9(\text{OH})_3$ as a white, crystalline solid.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{Br}_9(\text{OH})_3$ (percent): Cs, 22.82; B, 11.06; Br, 61.74. Found (percent): Cs, 22.10; B, 12.40, 12.14; Br, 63.48, 63.26.

The second portion of solids is dissolved in water and the solution is passed through a column packed with a strong acid ion-exchange resin. The effluent is neutralized with $(\text{CH}_3)_4\text{NOH}$ and evaporated under reduced pressure at 35°C . to obtain $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Br}_9(\text{OH})_3$. The compound is further purified by crystallization from 50% aqueous alcohol.

Analysis.—Calc'd for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Br}_9(\text{OH})_3$ (percent): B, 12.39; N, 2.67; C, 9.16; H, 2.60; Br, 68.60. Found (percent): B, 12.36; N, 2.69, 2.27; C, 9.40; H, 2.82; Br, 68.65.

EXAMPLE 31

Sufficient water is added to 2.0 g. of $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{OCH}_3$, prepared as described in Example 11, Part B, to form a clear solution at 90°C . Chlorine gas is passed into the solution at this temperature and water is added as needed to maintain a clear solution. Passage of chlorine is continued until reaction is complete and the solution is then cooled. White crystals of hydrated $\text{Cs}_2\text{B}_{12}\text{HCl}_{10}\text{OCH}_3$ precipitate. The crystals are separated and crystallized from water.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{HCl}_{10}\text{OCH}_3 \cdot \text{H}_2\text{O}$ (percent): Cs, 33.2; B, 16.2; C, 1.5; H, 0.75; Cl, 44.4. Found (percent): Cs, 32.9; B, 16.4; C, 1.3; H, 0.96; Cl, 44.1.

EXAMPLE 32

A suspension is prepared consisting of 150 ml. of methanol and 3.5 g. of $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{11}\text{OCH}_2\text{CH}_2\text{OCH}_3$, obtained as described in Example 17, Part A. The suspension is cooled to 10°C . and this temperature is maintained while a solution

of 27.8 g. of bromine in 40 ml. of methanol is added dropwise with stirring. The reaction mixture is allowed to warm to atmospheric temperature and it is stirred for 11 hours. The solution is concentrated on a rotary evaporator and $(\text{CH}_3)_4\text{NBr}$ separates. The mixture is filtered and the filtrate is evaporated to dryness. A gray solid form which is crystallized from water to obtain crystalline white $[(\text{CH}_3)_4\text{NB}_{12}\text{H}_3\text{Br}_6\text{OCH}_2\text{CH}_2\text{OCH}_3]$.

Analysis.—Calc'd for the above product (percent): B, 13.04; Br, 64.22; C, 13.27; H, 3.44; N, 2.81. Found (percent): B, 12.62; Br, 64.39; C, 12.62; H, 3.03; N, 2.19, 2.13.

EXAMPLE 33

Chlorine gas is bubbled through a mixture of acetonitrile and $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{CH}(\text{CH}_3)_2$, obtained as described in Example 21. The temperature of the reaction mixture is maintained at 25–40° C. during the process and passage of gas is continued until no further absorption occurs. The solution is evaporated to dryness and the solid residue is recrystallized from water to obtain $\text{Cs}_2\text{B}_{12}\text{H}_4\text{Cl}_7\text{CH}(\text{CH}_3)_2$.

Analysis.—Calc'd for above compound (percent): C, 5.10; H, 1.60; Cl, 36.20. Found (percent): C, 4.64; H, 1.56; Cl, 35.47.

EXAMPLE 34

A portion of the product, whose average composition is $\text{Cs}_2\text{B}_{12}\text{H}_{10.6}(\text{C}_2\text{H}_4\text{C}_6\text{H}_5)_{1.4}$, which is obtained as described in Example 25, Part B, is mixed with acetonitrile and the mixture is chlorinated as described in Example 33. The reaction mixture is processed to obtain the cesium salt which is shown by elemental analysis to have the average composition $\text{Cs}_2\text{B}_{12}\text{Cl}_{10.6}(\text{C}_2\text{H}_4\text{C}_6\text{H}_5)_{1.4}$.

Analysis.—Calc'd for above composition (percent): C, 16.40; H, 1.50; Cl, 46.10. Found (percent): C, 17.46; H, 1.98; Cl, 46.41.

The acid $\text{H}_2\text{B}_{12}\text{H}_{12}$ (and its hydrates) reacts with nitriles, e.g., acetonitrile, propionitrile, benzonitrile, to form dodecaborates having nitrogen-containing substituents whose structure has not been determined exactly. The substituted compounds can be reacted with halogens, e.g., bromine, to obtain dodecaborates bearing both bromine and nitrogen-containing substituents. The preparation of those compounds is illustrated in Example 35.

EXAMPLE 35

(A) A mixture of 100 ml. of CH_3CN and 24 g. of hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ (N.E., 186) is refluxed on a steam bath for about 9.5 days. The solution is divided into two equal parts.

Aqueous CsOH solution is added to one part and aqueous $(\text{CH}_3)_4\text{NOH}$ is added to the second part. The precipitates which form are separated to obtain the cesium and tetramethylammonium salts of substituted dodecaborates. The infrared absorption spectrum of the cesium salt shows a sharp band at 3.0μ and a broad band at 6.3μ . The elemental analyses of each of the salts is as follows:

Cs salt: Cs, 48.1; B, 36.6; C, 3.20; H, 4.40; N, 3.2.

$(\text{CH}_3)_4\text{N}$ salt: B, 52.9; C, 19.0; H, 11.5; N, 9.8.

Portions of each of the salts are refluxed in concentrated aqueous HBr for a short period and the solutions are neutralized with base. The salts are separated and have the following elemental analysis:

Cs salt: Cs, 55.9; B, 25.1; C, 2.0; H, 3.2; N, 3.3.

$(\text{CH}_3)_4\text{N}$ salt: B, 55.6; C, 19.7; H, 11.2; N, 10.7.

Portions of each of the salts are boiled in concentrated aqueous HBr for a short period and they are then treated with liquid bromine as described in Example 3, Part L. The salts are isolated and they show the following elemental analyses:

Cs salt: Cs, 15.3; B, 10.8; C, 2.5; H, 0.9; Br, 67.7; N, 1.2.

$(\text{CH}_3)_4\text{N}$ salt: B, 13.3; C, 5.9; H, 2.5; Br, 76.0; N, 2.9.

(B) A mixture of 100 ml. of propionitrile and 24.5 g. of hydrated $\text{H}_2\text{B}_{12}\text{H}_{12}$ (N.E., 190) is refluxed for about 9.5 days. The reaction mixture is processed in the manner described in Part A, including refluxing with HBr and perbromination. The infrared absorption spectrum of the cesium salt as obtained initially, shows a characteristic double peak at 9.5μ . Elemental analyses of the Cs and $(\text{CH}_3)_4\text{N}$ salts are as follows:

Cs salt: Cs, 49.0; B, 34.7; C, 5.0; H, 4.5; N, 3.3.

$(\text{CH}_3)_4\text{N}$ salt: B, 45.3; C, 26.6; H, 11.3; N, 13.6.

After treatment with refluxing HBr solution, the elemental analyses are:

Cs salt: Cs, 34.7; B, 23.8; C, 2.3; H, 3.2; N, 3.3.

$(\text{CH}_3)_4\text{N}$ salt: B, 53.2; C, 21.8; H, 11.4; N, 9.1.

After treatment with refluxing HBr solution and with liquid bromine, the elemental analyses are:

Cs salt: Cs, 15.1; B, 10.8; C, 3.6; H, 1.3; Br, 67.0; N, 1.5.

$(\text{CH}_3)_4\text{N}$ salt: B, 12.9; C, 8.0; H, 2.6; Br, 74.5; N, 3.0.

EXAMPLE 36

(A) A mixture consisting of 10 g. of hydrated crystalline $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_{12}$ and 20 g. of hydrogen sulfide is heated in a pressure vessel under autogenous pressure with agitation for 4 hours at 100°C . The vessel is cooled, vented and flushed with nitrogen. The reaction mixture is neutralized with cesium hydroxide and the precipitate which forms is separated and recrystallized twice from water. The product is $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{SH}$ whose infrared spectrum (mineral oil mull) shows slight absorption at 2.8 and 6.3μ ; strong absorption at 4.0μ ; moderate absorption at 9.5, 10.3, 11.9 and 13.9μ .

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{SH}$ (percent): B, 29.7; S, 7.3; H, 2.7; Cs, 60.5. Found (percent): B, 30.1; S, 7.5; H, 2.8; Cs, 60.0.

(B) The cesium salt obtained above is dissolved in CH_3CN and chlorine gas is passed into the solution at $25\text{--}32^\circ\text{C}$. for 15 minutes. The solution is evaporated and the solid residue is recrystallized from water to obtain a product whose analysis agrees fairly well for the composition $\text{Cs}_2\text{B}_{12}\text{H}_4\text{Cl}_2\text{SH}$ or the closely related disulfide $[\text{Cs}_2\text{B}_{12}\text{H}_4\text{Cl}_2\text{S}]_2$. The infrared absorption spectrum shows bands at 2.8, 6.2 and 9.5μ (strong); and weak bands at 10.5, 11.2, 11.7 and 13.8μ .

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_4\text{Cl}_2\text{SH}$ (percent): Cl, 36.5; S, 4.7; B, 19.1. Found (percent): Cl, 35.5; S, 4.7; B, 19.0.

EXAMPLE 37

(A) A weighed portion (1.1 g.) of crude $\text{Cs}_2\text{B}_{12}\text{H}_{10}[\text{C}(\text{O})\text{NH}_2]_2$, prepared as described in Example 41, is heated under very low pressure to a maximum of 410°C . for a period of one hour. The residue is cooled and is dissolved in a few milliliters of water. An equal volume of aqueous 50% CsCl is added and the solution is chilled to precipitate $\text{CsB}_{12}\text{H}_{10}(\text{CN})_2$. The precipitate is separated, washed and dried to obtain 0.3 g. of product. The infrared spectrum of the product shows major absorption bands at the following wavelengths (expressed as cm^{-1}): 2500, 2190, 1260, 1040, 1020, 850 and 725.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{10}(\text{CN})_2$ (percent): C, 5.2; H, 2.2; B, 28.4; N, 6.1; Cs, 58.0. Found (percent): C, 5.1; H, 2.6; B, 27.6; N, 4.8; Cs, 55.4.

(B) A mixture consisting of 10 g. of a crystalline hydrate of $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_{12}$ and 15 g. of cyanogen chloride (CNCl) is reacted in a pressure vessel at 225 psi. pressure and at $25\text{--}26^\circ\text{C}$. for 4 hours. The product is a friable mass. It is dissolved in dilute aqueous NaOH solution and to this solution is added an aqueous 50% CsF solution. The precipitate which forms is separated and recrystallized from water. The product is principally $\text{Cs}_2\text{B}_{12}\text{H}_6\text{Cl}_2(\text{CN})_4$. Its infrared absorption spectrum includes the following bands: 2.75, 2.9, 3.95, 4.5, 6.2 (broad), 10.3 (shoulder at 9.9), 12.2 and 13.7μ (broad).

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_6\text{Cl}_2(\text{CN})_4$ (percent): C, 8.3; H, 2.1; Cl, 12.2; N, 9.7. Found (percent): C, 7.5; H, 4.2; Cl, 13.7; N, 10.3.

EXAMPLE 38

(A) The crude reaction product obtained from $\text{H}_2\text{B}_{12}\text{H}_{12}$ and CO , as described in Example E, is dissolved in water and aqueous CsF is added to the solution. The precipitate which forms is extracted repeatedly with water and the least water-soluble fraction is isolated. This fraction is $\text{Cs}_2\text{B}_{12}\text{H}_{11}(\text{COOH})$. The infrared absorption spectrum shows strong absorption at 6.0μ , i.e., for the $-\text{C}(\text{O})\text{OH}$ group.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{11}(\text{COOH})$ (percent): C, 2.4; H, 2.4; B, 28.8. Found (percent): C, 2.6; H, 2.5; B, 27.6.

(B) A portion of the above salt is dissolved in excess aqueous NaOH solution to form $\text{Na}_2\text{B}_{12}\text{H}_{11}(\text{COONa})$ in solution. This solution is added to a large excess of aqueous TiNO_3 solution and the precipitate which forms is isolated. It is $\text{Ti}_2\text{B}_{12}\text{H}_{11}(\text{COOTi})$. The infrared spectrum shows absorption bands at 6.8μ , i.e., for the $-\text{C}(\text{O})\text{OTi}$ group.

(C) Sufficient $B_{12}H_{10} \cdot 2CO$ is added gradually and carefully to a quantity of water to form a solution containing about 10% by weight of the dicarbonyl compound. The $B_{12}H_{10} \cdot 2CO$ reacts vigorously with the water during addition and the compound formed in solution is dihydrogen dicarboxydecahydride-dodecarboxate $^{2-}$, i.e., $H_2B_{12}H_{10}(COOH)_2$. In its hydronium form the compound is $(H_3O)_2B_{12}H_{10}(COOH)_2$.

The acid is dehydrated easily to the bis(carbonyl) compound and, for this reason, the acid is preferably kept in aqueous solution. The solutions are stable and can be stored in conventional equipment customarily used for strong inorganic acids.

The identity of the acid is confirmed by the nuclear magnetic resonance spectrum of its aqueous solution. The B_{11} resonance shows two peaks, the more intense of which is displaced +39.4 p.p.m. and the weaker peak +47.4 p.p.m. from trimethyl borate.

(D) An aqueous solution of CsF is added to a portion of the solution of the acid obtained in Part C. The precipitate which forms is separated and it is recrystallized fractionally from water to obtain $Cs_2B_{12}H_{10}(COOH)_2$.

The infrared absorption spectrum of a mineral oil mull of the compound shows the following bands: 2.65, 3.9, 5.9, 7.9, 9.3, 9.6, 10.8, 13.8 (broad) and 14.4 μ .

Analysis.—Calc'd for $Cs_2B_{12}H_{10}(COOH)_2$ (percent): C, 4.7; H, 2.9; B, 26.0; Cs, 53.6. Found (percent): C, 4.7; H, 2.9; B, 25.9; Cs, 52.7.

(E) An excess of aqueous NaOH solution is added to a second portion of the acid solution of Part C to obtain a solution of $Na_2B_{12}H_{10}(COONa)_2$. This solution is added to a large excess of an aqueous thallium nitrate solution and the precipitate which forms is separated to obtain $Tl_2B_{12}H_{10}(COOTl)_2$.

The infrared spectrum of a mineral oil mull shows absorption at 4.0, 7.5, 9.7, 10.0, 10.6, 13.2, and 13.9 μ .

Analysis.—Calc'd for $Tl_2B_{12}H_{10}(COOTl)_2$ (percent): C, 2.3; H, 1.0; B, 12.4. Found (percent): C, 2.7; H, 1.1; B, 12.8.

EXAMPLE 39

(A) Gaseous chlorine is bubbled through a solution consisting of 0.5 g. of $B_{12}H_{10} \cdot 2CO$ and 25 ml. of water. An exothermic reaction occurs and the temperature of the solution rises to a maximum of about 50° C. before subsiding. The solution is now heated to 90–100° C. and passage of chlorine gas is continued until the solution shows the color of excess chlorine. The reaction mixture is now cooled and an excess of an aqueous solution of $(CH_3)_4NCl$ is added. A white precipitate forms which redissolves when the solution is heated. The hot solution is cooled and the crystalline solid which forms is separated by filtration to obtain 1.5 g. of $[(CH_3)_4N]_2B_{12}H_2Cl_8(COOH)_2$. The infrared spectrum of the compound shows major absorption bands at the following wavelengths (expressed as microns): 5.95; 6.05, 6.75, 7.8, 9.6, 10.55, 11.65 and 13.84.

Analysis.—Calc'd for $[(CH_3)_4N]_2B_{12}H_2Cl_8(COOH)_2$ (percent): C, 18.4; H, 4.0; N, 4.3; B, 20.0; Cl, 43.5. Found (percent): C, 17.7; H, 4.2; N, 4.4; B, 19.5; Cl, 44.7.

(B) A reaction vessel is charged with 0.5 g. of $B_{12}H_{10} \cdot 2CO$ and 25 ml. of water. A solution forms and to it 4.5 g. of iodine is added with stirring. The solution is refluxed for 2 hours, cooled to atmospheric temperature and filtered to remove undissolved iodine. The filtrate is heated to boiling and nitrogen gas is bubbled through it to remove unreacted dissolved iodine. A small quantity of mercury is added to the solution followed by a small quantity of zinc dust to remove the last traces of unreacted iodine. The solution which is nearly colorless is filtered and an aqueous solution of $(CH_3)_4NCl$ is added to the filtrate. A white solid is formed which redissolves on heating the solution to boiling. The solution is now chilled and the crystals which form are separated. The crystalline product is redissolved in a minimum amount (about 30 ml.) of hot water to form a clear solution. On cooling to atmospheric temperature a small quantity (0.2 g.) of $(CH_3)_4NI$ separates which is removed by filtration. The filtrate is chilled to about 0° C. or less and the solid which forms is separated, washed and dried to yield a mixture of $[(CH_3)_4N]_2B_{12}H_2I_3(COOH)_2$ and $(CH_3)_4NI$ in a molar ratio of 1:2.5. The infrared spectrum shows major absorption bands (expressed as cm^{-1}) at 2500, 1650, 1250, 1050, and 940.

Analysis.—Calc'd for $[(CH_3)_4N]_2B_{12}H_2I_3(COOH)_2 \cdot 2.5(CH_3)_4NI$ (percent): C, 19.1; H, 5.1; B, 10.3; N, 5.0; I, 55.5. Found (percent): C, 18.7; H, 5.1; B, 9.9; N, 4.0; I, 54.8.

EXAMPLE 40

A reaction vessel is charged with 10 ml. of methanol and 0.5 g. of $B_{12}H_{10}\cdot 2CO$ is added with stirring. The reaction is exothermic and a solution forms. The solution is warmed to incipient refluxing for about 30 minutes. A solution consisting of 1.0 g. of $(CH_3)_4NCl$ in 20 ml. of methanol is added with stirring and a solid product forms. The solid does not redissolve on heating even with the addition of more methanol. The slurry is chilled and the solid product is separated by filtration. It is washed and dried to obtain 0.9 g. of $[(CH_3)_4N]_2B_{12}H_{10}[C(O)OCH_3]_2$. The infrared spectrum of the compounds shows absorption bands at the following wavelengths (expressed as cm^{-1}): 2500, 1660, 1480, 1200, 1070, 1040, 1000–1015, 950, 885, 760, and 730.

Analysis.—Calc'd for $[(CH_3)_4N]_2B_{12}H_{10}[C(O)OCH_3]_2$ (percent): C, 35.5; H, 9.9; B, 32.0; N, 6.9. Found (percent): C, 35.1; H, 10.0; B, 31.9; N, 7.0.

EXAMPLE 41

(A) A reaction vessel is charged with 1 g. of $B_{12}H_{10}\cdot 2CO$ and the vessel and contents are cooled to about $-80^\circ C$. Pressure in the vessel is reduced to a very low value and about 25 ml. of liquid ammonia is condensed into the vessel. A white slurry forms and it is allowed to warm gradually to permit excess ammonia to evaporate. A white solid remains which is $(NH_4)_2B_{12}H_{10}[C(O)NH_2]_2$. The solid is held under a reduced pressure of about 10^{-3} mm. Hg at prevailing atmospheric temperature to remove the last traces of unreacted ammonia. The infrared spectrum of the compound shows characterizing bands at the following wavelengths (expressed as cm^{-1}): 3450, 3300, 3200, 2500, 1625, 1500, 1430, 1400, 1100, 1050, 1010, 865, 815, 725 and 670. The ammonium salt is very soluble in water.

Analysis.—Calc'd for $(NH_4)_2B_{12}H_{10}[C(O)NH_2]_2$ (percent): B, 49.2; N, 21.2; C, 9.1; H, 8.4. Found (percent): B, 48.8; N, 21.2; C, 9.4; H, 8.5.

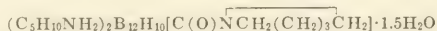
The ammonium salt is dissolved in water and the aqueous solution is passed through a column filled with an acid ion-exchange resin to obtain the acid, $H_2B_{12}H_{10}[C(O)NH_2]_2$. Aqueous solutions of this acid are reacted with $CsOH$, $(CH_3)_4NOH$ and $(CH_3)_3SOH$ to form, respectively, $Cs_2B_{12}H_{10}[C(O)Nj]_2$, $[(CH_3)_4N]_2B_{12}H_{10}[C(O)NH_2]_2$ and $[(CH_3)_3S]_2B_{12}H_{10}[C(O)NH_2]_2$. The salts are white, crystalline, highly water-soluble compounds.

(B) A portion of the ammonium salt obtained in Part A is dissolved in a small quantity of water. The solution is made basic by addition of a small quantity of NH_4OH and an aqueous solution of $CsCl$ is added in excess. Crude $Cs_2B_{12}H_{10}[C(O)NH_2]_2$ precipitates and it can be separated if desired. Alternatively, the mixture is heated to boiling for a few minutes and the solution is chilled. A white crystalline product then separates which is a hydrate of $Cs_2B_{12}H_{10}[C(O)OH][C(O)NH_2]$. The compound is called dicesium monocarboxymonocarbamyldodecahydridecarborate(2 $^-$). Its infrared spectrum contains the following characteristics absorption bands (wavelengths expressed as cm^{-1}): 3600, 3500, 3400, 1640, 1600, 1575, 1525, 1340, 1260, 1200, 1060, 1010, 910, 850, 735, and 695.

Analysis.—Calc'd for $Cs_2B_{12}H_{10}(COOH)(CONH_2\cdot H_2O)$ (percent): Cs, 51.8; B, 25.4; H, 2.9; C, 4.7; N, 2.7. Found (percent): Cs, 51.0; B, 25.8; H, 3.0; C, 5.1; N, 2.9.

(C) A reaction vessel is charged with 0.5 g. of $B_{12}H_{10}\cdot 2CO$ and 10 ml. of anhydrous benzene. The mixture is stirred and 3.0 ml. of freshly dried and distilled piperidine is added. A mildly exothermic reaction occurs and a white solid separates which does not redissolve on heating even after a further addition of 10 ml. of benzene. The mixture is now chilled, the solid is separated by filtration, washed with benzene and dried to obtain di(piperidinium) di(N-pentamethylenecarbamyl) decahydridecarborate (2 $^-$). The compound is further purified by recrystallization from aqueous ethanol. The infrared spectrum of the compound shows major absorption bands at the following wavelengths (expressed as cm^{-1}): 2500, 1610, 1480, 1250, 1160, 1035, 1025, 980, and 685.

Analysis.—Calc'd for



(percent): C, 46.9; H, 10.2; B, 23.0; N, 10.0. Found (percent): C, 43.5; H, 10.3; B, 23.0; N, 10.0.

EXAMPLE 42

A solution is prepared consisting of 0.5 g. of $B_{12}H_{10}\cdot 2CO$ and 10 ml. of anhydrous CH_3CN . To this solution is added with stirring 2 ml. of freshly dried $C_6H_5N(CH_3)_2$. This solution is warmed to incipient reflux temperature for 30 minutes and it

becomes yellow, then green and finally orange in color. Acetonitrile is removed by evaporation and the oil which remains is dissolved in aqueous ethanol. A small quantity of aqueous NaOH solution is added to make the mixture strongly basic. An aqueous solution of CsF is added in excess and the solution is chilled. Tan needles of $\text{Cs}_2\text{B}_{12}\text{H}_{10}[\text{C}(\text{O})\text{C}_6\text{H}_4\text{N}(\text{CH}_3)_2]_2$ form which are separated and recrystallized from water. The infrared spectrum of the compound shows absorption bands at the following wavelengths (expressed as cm^{-1}): 2500, 1600, 1560, 1530, 1300, 1250, 1185, 1170, 1120, 1060, 1035, 945, 920, 845, 820, 746, and 725.

Analysis.—Calc'd for $\text{Cs}_2\text{B}_{12}\text{H}_{10}[\text{C}(\text{O})\text{C}_6\text{H}_4\text{N}(\text{CH}_3)_2]_2$ (percent): Cs, 37.8; B, 18.5; H, 4.3; C, 30.8; N, 4.0. Found (percent): Cs, 35.4; B, 18.2; H, 4.8; C, 30.8; N, 4.1.

EXAMPLE 43

(A) A reaction vessel is charged with 20 ml. of dry xylene and 0.5 g. of $\text{B}_{12}\text{H}_{10}(\text{CO})_2$. The solution is stirred and 0.53 ml. of diethyl mercury is added gradually. The clear solution which forms is heated to refluxing and a white solid, which is $(\text{C}_2\text{H}_5\text{Hg})_2\text{B}_{12}\text{H}_{10}[\text{C}(\text{O})\text{C}_2\text{H}_5]_2$, separates. The suspension of solid and liquid is maintained at incipient reflux temperature for 30 minutes and the mixture is then allowed to cool to about 25°C . The solid is separated and washed thoroughly with dry xylene and dry ether. The washed product is dried at very low pressure (about 10^{-3} mm. Hg) at atmospheric temperature to obtain pure $(\text{C}_2\text{H}_5\text{Hg})_2\text{B}_{12}\text{H}_{10}[\text{C}(\text{O})\text{C}_2\text{H}_5]_2$. The infrared spectrum of the compound shows absorption bands at the following wavelengths (expressed as cm^{-1}): 2450, 1550, 1330, 1160, 1100, 1070, 940, and 710.

Analysis.—Calc'd for $(\text{C}_2\text{H}_5\text{Hg})_2\text{B}_{12}\text{H}_{10}[\text{C}(\text{O})\text{C}_2\text{H}_5]_2$ (percent): Hg, 56.2; B, 18.2. Found (percent): Hg, 54.0; B, 19.3.

(B) A portion of the mercury salt of Part A is suspended in aqueous alcohol and the suspension is heated to refluxing. Hydrogen sulfide is bubbled through the hot liquid and mercury sulfide precipitates. The mixture is filtered and the filtrate is partially evaporated. The residual liquid is mixed with an excess of aqueous $(\text{CH}_3)_4\text{NCl}$ solution and the solution is concentrated to a small volume. Chilling of the solution results in precipitation of $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{10}[\text{C}(\text{O})\text{C}_2\text{H}_5]_2$. The product is separated by filtration and dried as described in Part A. The infrared spectrum of the compound shows absorption bands at the following wavelengths (expressed as cm^{-1}): 2500, 1630, 1490, 1400, 1160, 1075, 950 and 725.

(C) A second portion of the mercury salt of Part A is suspended in about 20 ml. of ethanol. Liquid bromine is added dropwise and with stirring. The reaction is exothermic and care is exercised during the addition of the bromine. When the vigor of the reaction subsides the mixture is heated to reflux temperature and addition of bromine is continued until an excess of bromine is present as shown by the color of the solution. Chlorine gas is now bubbled through the refluxing solution for 30 minutes after which nitrogen gas is bubbled through the mixture to remove unreacted halogens. An excess of aqueous $(\text{CH}_3)_4\text{NCl}$ solution is added, the mixture is heated to boiling and portions of alcohol and water are added in sufficient amount to form a clear solution. The solution is chilled and a solid product precipitates. It is separated, dried, extracted with boiling alcohol and then with boiling water. The residue is suspended in hot aqueous alcohol and hydrogen sulfide is passed into the suspension to precipitate mercury as the sulfide. The hot solution is filtered and the filtrate is chilled to precipitate $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Br}_{10}[\text{C}(\text{O})\text{C}_2\text{H}_5]_2$. The infrared spectrum of the compound shows absorption bands at the following wavelengths (expressed as cm^{-1}): 1650, 1150, 1110, 1055, 990, 950, 880, 845, and 720.

EXAMPLE 44

(A) The procedure of Example 43, Part A, is repeated employing a solution of 0.5 g. of $\text{B}_{12}\text{H}_{10}(\text{CO})_2$ in 20 ml. of dry xylene and 2.0 g. of $(\text{C}_6\text{H}_5)_2\text{Hg}$. The mercury salt which is obtained has the formula $(\text{C}_6\text{H}_5\text{Hg})_2\text{B}_{12}\text{H}_{10}[\text{C}(\text{O})\text{C}_6\text{H}_5]_2$. The infrared spectrum of the compound comprises the following absorption bands (expressed as cm^{-1}): 2500, 1590, 1525, 1250, 1180, 1025, 845, 765, and 690.

(B) The mercury salt of Part A is processed as described in Example 43, Part C to obtain $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{Br}_{10}[\text{C}(\text{O})\text{C}_6\text{H}_5]_2$. The infrared spectrum of the compound contains absorption bands at the following wavelengths (expressed as cm^{-1}): 1620, 1280, 1185, 990, 850, 770, and 705.

The process illustrated in Examples 43 and 44 is generic for the preparation of compounds of Formula 1 in which X is a carbacyl group, i.e., $\text{RC}(\text{O})$. By employing the appropriate mercurials and $\text{B}_{12}\text{H}_{10}(\text{CO})_2$, compounds such as $(\text{NH}_4)_2\text{B}_{12}\text{H}_{10}[\text{C}(\text{O})\text{C}_6\text{H}_{11}]_2$, $\text{Na}_2\text{B}_{12}\text{H}_{10}[\text{C}(\text{O})\text{C}_4\text{H}_9]_2$, $\text{Cs}_2\text{B}_{12}\text{H}_{10}[\text{C}(\text{O})\text{C}_6\text{H}_4\text{CH}_3]_2$, and

the like can be obtained. Modifications of the process can be made, e.g., other organometallics can be employed in place of the organomercurials as reactants.

EXAMPLE 45

(A) A solution is prepared consisting of 5.6 g. of $\text{Na}_2\text{B}_{12}\text{H}_{12} \cdot 2\text{H}_2\text{O}$ (.025 mole), 2.82 g. of $\text{H}_2\text{NOSO}_3\text{H}$ (0.025 mole), and 50 ml. of water. The solution is neutralized to a pH of 7 with aqueous NaOH solution, and it is then refluxed for 1.5 hours. The solution is evaporated under reduced pressure and the residue is mixed with an aqueous solution of $(\text{CH}_3)_4\text{NCl}$. A white solid forms which is separated to obtain 3 g. of crude $(\text{CH}_3)_4\text{NHB}_{12}\text{H}_{11}\text{NH}_2$ which can also be written as $(\text{CH}_3)_4\text{NB}_{12}\text{H}_{11}\text{NH}_3$ to show the close association of the acidic proton with the $-\text{NH}_2$ substituent. The product is recrystallized four times from water and is obtained as beautiful white plates. The infrared spectrum shows characterizing absorption bands at 3240 and 1580 cm^{-1} as well as other characterizing bands for the dodecaborate cage.

Analysis.—Calc'd for $(\text{CH}_3)_4\text{NHB}_{12}\text{H}_{11}\text{NH}_2$ (percent): C, 20.8; H, 11.3; B, 55.9; N, 12.7. Found (percent): C, 20.2; H, 11.2; B, 55.2; N, 12.2.

(B) An aqueous solution $\text{Cs}_2\text{B}_{12}\text{H}_{11}\text{COOH}$ (see Example 38, Part A) is prepared and there is added to it with stirring an excess of an aqueous solution of $\text{H}_2\text{NOSO}_3\text{H}$. Gas evolves spontaneously from the reaction mixture. After gas evolution ceases, the mixture is chilled and colorless needles separate from the solution. The needles are removed by filtration, washed and dried to obtain $\text{CsHB}_{12}\text{H}_{11}\text{NH}_2$ in pure form. The infrared spectrum of the product shows characterizing absorption bands as follows (expressed as microns): 3.05, 4.0, 6.3, 7.1, 9.4, 9.8, and 13.8. The compound can also be written as $\text{CsB}_{12}\text{H}_{11}\text{NH}_3$ to show the close association of the acidic proton with the $-\text{NH}_2$ group.

(C) A solution of 67 g. of $\text{Na}_2\text{B}_{12}\text{H}_{12} \cdot 2\text{H}_2\text{O}$ and 100 g. of $\text{H}_2\text{NOSO}_3\text{H}$ in 250 ml. of water is neutralized by adding, at a temperature below 25° C. a solution of 36 g. of sodium hydroxide in 100 ml. of water. The solution is heated cautiously until an exothermic reaction begins (at about 70° C.). The mixture is then cooled to moderate the reaction which continues for about 30 minutes. The solution is now cooled to about 5° C. and the precipitate which forms is separated to obtain 9 g. of $\text{H}_2\text{B}_{12}\text{H}_{10}(\text{NH}_2)_2$ as a white crystalline solid. Concentration of the filtrate to about one-half of its original volume and cooling yields an additional 7 g. of product (referred to as the second fraction).

The first fraction is recrystallized twice from water to obtain a very sparingly soluble crystalline product.

Analysis.—Calc'd for $\text{H}_2\text{B}_{12}\text{H}_{10}(\text{NH}_2)_2$ (percent): B, 74.6; H, 9.3; N, 16.1. Found (percent): B, 74.8; H, 9.2; N, 15.8.

The second fraction of crystals are recrystallized from a relatively small volume of water to obtain a more soluble crystalline product.

Analysis.—Found (percent): B, 74.6; H, 8.5; N, 15.3.

The two fractions isolated and purified as described above are isomeric forms of $\text{H}_2\text{B}_{12}\text{H}_{10}(\text{NH}_2)_2$. The two isomers differ in their solubility in water. The compound can also be written as $\text{B}_{12}\text{H}_{10}(\text{NH}_3)_2$ to show the close association of the protons with the amine substituents.

(D) An aqueous solution of $\text{H}_2\text{B}_{12}\text{H}_{10}(\text{COOH})_2$ is mixed with an aqueous solution of hydroxylamine-O-sulfonic acid. A gas (CO_2) is evolved and a solid precipitates which is separated by filtration. It is washed and dried to obtain $\text{H}_2\text{B}_{12}\text{H}_{10}(\text{NH}_2)_2$. The identity of the compound is confirmed by its infrared absorption spectrum which shows characterizing bands at 9.4 μ and 10.5 μ . The intensities of these bands are reversed from the intensities of the corresponding bands of the compounds obtained in Part C, showing a different distribution of isomers in the products made by the two methods.

Additional examples of products of the invention which can be obtained by the amination procedure of Example 45, are given in Table III. In each instance the boron-containing reactant of column 1 and the hydroxylamino-O-sulfonic acid of column 2, neutralized with the base of column 3, are reacted preferably in aqueous solution at a temperature between about 60° C. and 100° C., to give the product or products of column 4. When both monoaminated and diaminated compounds are possible products, i.e., when either one or two amino groups (NRR') can be introduced, the major product is determined by the ratio of the reactants. The acids of the diamino-substituted anions shown in column 4 are obtained by passing the salts, bearing cations of the bases shown in column 3 through an acid ion-exchange resin, as described earlier.

TABLE III

Column 1	Column 2	Column 3	Column 4
Boron-containing reactant	Hydroxylamine-o-sulfonic acid	Neutralizing agent	Product or products
$H_7B_{12}H_6Cl_6$	H_2NOSO_3H	$NaOH$	$(NaHB_{12}H_5Cl_6NH_2)$ $(H_2B_{12}H_5Cl_6(NH_2)_2)$
$CaB_{12}H_{11}I$	CH_3NHOSO_3H	$Ca(OH)_2$	$(Ca(HB_{12}H_{10}NHCH_3)_2)$ $(H_2B_{12}H_9I(NHCH_3)_2)$
$(NH_4)_2B_{12}H_{10}(C_2H_5)_2$	H_2NOSO_3H	NH_4OH	$(NH_4HB_{12}H_9(C_2H_5)_2NH_2)$ $(H_2B_{12}H_9I(C_2H_5)_2(NH_2)_2)$
$BaB_{12}H_{11}OC_2H_4CH_2C_6H_5$	$C_4H_9NHOSO_3H$	$Ba(OH)_2$	$(Ba(HB_{12}H_{10}(OC_2H_4CH_2C_6H_5)NHC_4H_9)_2)$ $(H_2B_{12}H_9I(OC_2H_4CH_2C_6H_5)(NHC_4H_9)_2)$
$MgB_{12}H_{11}SC_4H_9$	$C_2H_5NHOSO_3H$	$NaOH$	$(Mg(HB_{12}H_{10}(SC_4H_9)(NHC_2H_5)_2)$ $(NaHB_{12}H_{10}(SC_4H_9)(NHC_2H_5)_2)$
$Na_2B_{12}H_{11}C_{12}H_{25}$	H_2NOSO_3H	Na_2CO_3	$(H_2B_{12}H_9(SC_4H_9)(NHC_2H_5)_2)$ $(NaHB_{12}H_{10}(C_{12}H_{25})(NH_2)_2)$
$(NH_4)_2B_{12}H_{11}OC_6H_5$	$(C_2H_5)_2NOSO_3H$	NH_4OH	$(H_2B_{12}H_9(C_{12}H_{25})(NH_2)_2)$ $(NH_4HB_{12}H_{10}(OC_6H_5)[N(C_2H_5)_2])$ $(H_2B_{12}H_9(OC_6H_5)[N(C_2H_5)_2])$

The NH_2 -substituted compounds can be N-alkylated by reaction with alkyl sulfates to obtain compounds of Formula 1 in which X is $-NR_2$. To illustrate, a mixture of $(CH_3)_4NHB_{12}H_{11}NH_2$ and water is heated to reflux temperature, Dialkyl sulfate [e.g., $(CH_3)_2SO_4$] and an aqueous NaOH solution are added to the mixture to form a slightly basic solution and the mixture is heated again to reflux temperature. Aqueous NaOH solution and dialkyl sulfate are added at intervals about every 15 minutes) during the period of refluxing. Finally, sufficient aqueous NaOH solution is added to make the solution alkaline and the mixture is refluxed again for about one hour. The mixture is cooled and the solvent is removed for evaporation. The residue can, if desired, be divided into several portions. The portions are mixed with aqueous solution of salts, e.g. $(CH_3)_4(NCl, CsF, TiNO_3)$ and the like, to precipitate salts of the anion $B_{12}H_{11}NR_2^{-}$. Examples of salts which can be obtained by the above procedure are $(CH_3)_4NHB_{12}H_{11}N(CH_3)_2$, $CsHB_{12}H_{11}N(C_2H_5)_2$, $TiHB_{12}H_{11}(C_2H_5)_2$ and the like. These acid salts can be dissolved in aqueous alkaline solutions (e.g., NaOH) and the alkaline solutions can then be treated with a further quantity of the salts illustrated above to obtain normal salts.

EXAMPLE 46

(A) A mixture consisting of 10 g. of crystalline hydrated $(H_3O)_2B_{12}H_{12}$ and 25 g. of HCN is heated in a pressure vessel under autogenous pressure at $100^\circ C$. for 4 hours. The vessel is cooled, vented and the reaction mixture is blown with nitrogen to remove unreacted HCN. The viscous residue is neutralized with aqueous CsOH solution, and the cesium salt which precipitates is separated. It is recrystallized repeatedly from water to obtain a product whose elemental analysis shows that 1-2 moles of HCN have combined with each mole of $B_{12}H_{12}^{-2}$ anion. The analyses are: C, 4.31; H, 5.22; N, 4.59. The infrared spectrum of the product shows absorption at 2.8, 3.1 4.0, 6.15, 6.7 and 9.5 μ .

(B) The process of part A is repeated five times, employing 15.0 g. of hydrated crystalline $(H_3O)_2B_{12}H_{12}$ and 30 g. HCN. The first batch is heated at $100^\circ C$. for 4 hours, the remaining batches at $110^\circ C$ for 4 hours. The non-volatile residues of the five runs are combined and the combined product is processed as described in Part A to obtain 99 g. of product whose infrared spectrum shows absorption at 2.7, 3.1, 4.0, 6.1, 6.6, 7.5, 8.0, 9.5, 9.8, 11.2, 12.0 and 13.9 μ . Elemental analyses are as follows: C, 5.6; H, 4.3; N, 5.3; B, 36.6. The product is a mixture containing $Cs_2B_{12}H_{10}(N=CH_2)_2$, $CsHB_{12}H_{10}(N=CH_2)(NHCH_3)$ and $CsHB_{12}H_{11}NHCH_3$.

(C) A portion of the product obtained in Part A is dissolved in water and an aqueous solution of $(CH_3)_3SI$ is added with stirring. The precipitate which forms is separated and recrystallized to give a product which is predominantly $(CH_3)_3SHB_{12}H_{11}NHCH_3$. The acidic proton is closely associated with the methylamion group and the compound can also be written as $(CH_3)_3SB_{12}H_{11}NH_2CH_3$.
Analysis.—Calcd. for $(CH_3)_3SHB_{12}H_{11}NHCH_3$ (percent): C, 19.2; H, 10.0; S, 12.8; N, 5.7. Found (percent): C, 18.2; H, 9.5; S, 12.9; N, 6.5.

(D) A second portion of the product obtained in part A is dissolved in water and an aqueous solution of $TiNO_3$ is added with stirring. The precipitate is purified as described in part C to obtain $TiHB_{12}H_{11}NHCH_3$ or (to show the association of the acidic proton with the amine substituent) $TiB_{12}H_{11}NH_2CH_3$.

Analysis.—Calcd. for $\text{TiHB}_{12}\text{H}_{11}\text{NHCH}_3$ (percent): C, 3.2; H, 4.2; N, 3.8. Found (percent): C, 3.9; H, 3.6; N, 4.4.

(E) A mixture of 10 g. of hydrated crystalline $(\text{H}_3\text{O})_2\text{B}_{12}\text{H}_{12}$ and 20 g. of HCN is heated in a pressure vessel under autogenous pressure for 4 hours at 80–83° C. The reaction mixture is processed as described in part A with the exception that it is neutralized with dilute aqueous NaOH solution. An aqueous 50% CsF solution is added to the neutralized solution and the cesium salt which separates is purified by crystallization from water. Elemental analyses suggest that the compound is principally $\text{CsHB}_{12}\text{H}_{11}\text{N}=\text{CH}_2$.

Analysis.—Calcd. for $\text{CsHB}_{12}\text{H}_{11}\text{N}=\text{CH}_2$ (percent): C, 4.0; H, 3.1; N, 4.6. Found (percent): C, 4.3; H, 4.4; N, 4.1.

(F) A portion of the above product is dissolved in water and the solution is passed through a column filled with a sodium ion-exchange resin. The aqueous effluent is mixed with $(\text{CH}_3)_4\text{NCl}$ and $(\text{CH}_3)_4\text{NOH}$. The precipitate is separated and purified as described earlier to obtain the tetramethylammonium acid salt.

Analysis.—Calcd. for $(\text{CH}_3)_4\text{NHB}_{12}\text{H}_{11}\text{N}=\text{CH}_2$ (percent): C, 25.8; H, 10.0; N, 13.5. Found (percent): C, 26.1; H, 10.9; N, 11.6.

EXAMPLE 47

(A) A solution of 1.4 g. of $\text{B}_{12}\text{H}_{10}\cdot 2\text{CO}$ in 30 ml. of acetonitrile is added with stirring to a solution of 1.5 g. of sodium azide in 50 ml. of acetonitrile. Nitrogen gas (350 ml.) is evolved rapidly. After gas evolution has ceased, the reaction mixture is filtered and the filtrate is evaporated by a stream of air until a viscous syrup remains. The syrup is diluted with water and an aqueous solution of $(\text{CH}_3)_4\text{NCl}$ is added with stirring. A white precipitate forms which is separated to obtain $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{10}(\text{NCO})_2$. The product is recrystallized from water to yield 2.3 g. of white crystalline compound of Formula 1 bearing isocyanate substituents.

Analysis.—Calcd. for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{10}(\text{NCO})_2$ (percent): B, 34.88; C, 32.26; H, 9.21; N, 15.05. Found (percent): B, 34.79; C, 32.23; H, 9.14; N, 15.23.

The infrared absorption spectrum of the compound shows a strong band at 4.35 microns, characteristic of the $-\text{NCO}$ group.

(B) Gaseous chlorine is bubbled through an aqueous solution of 0.5 g. of $\text{B}_{12}\text{H}_{10}\cdot 2\text{CO}$ as described in Example 39. After chlorination is complete, the solution is evaporated to dryness in a sublimation unit and the residue is sublimed at 0.003 mm. Hg pressure to obtain 0.92 g. of sublimate on the water cooled condenser. A portion (0.5 g.) of the sublimate is dissolved in 5 ml. of dry CH_3CN and a suspension of 0.5 g. of NaN_3 in 5 ml. of CH_3CN is added to the solution with stirring. A mild exothermic reaction occurs and a gas is evolved. The mixture is heated to incipient reflux temperature for 1 hour and it is then evaporated to dryness. The residue is dissolved in water and an aqueous solution of $(\text{CH}_3)_4\text{NCl}$ is added in excess. The precipitate which forms is separated and heated to boiling with 60 ml. of water. The solid dissolves partially and the hot mixture is filtered. The filtrate is chilled and a total of 0.45 g. of a solid precipitates. The compound which is $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{HCl}_9(\text{NCO})_2$ is separated, washed and dried. Its infrared spectrum shows major absorption bands at the following wavelengths (expressed as cm^{-1}): 2300, 1700, 1480, 1280, 1060, 945, 855, and 725.

Analysis.—Calcd. for $[(\text{CH}_3)_4\text{N}]\text{B}_{12}\text{HCl}_9(\text{NCO})_2$ (percent): C, 17.6; H, 3.7; B, 19.1; Cl, 46.8; N, 8.2. Found (percent): C, 17.6; H, 4.1; B, 19.2; Cl, 45.6; N, 7.0.

EXAMPLE 48

A suspension of $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{10}(\text{NCO})_2$ in absolute ethanol is saturated with dry hydrogen chloride. Heat is evolved and the solid dissolves. After the heat of the reaction subsides, the clear solution is evaporated to dryness and the residue is dissolved in water. Sufficient aqueous solution of $(\text{CH}_3)_4\text{NOH}$ is added to the clear solution to form a neutral mixture. The mixture is evaporated to dryness and the solid residue is dissolved in hot ethanol containing a small quantity of water. The hot solution is chilled to obtain a crystalline product which is separated to yield 0.5 g. of $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{10}[\text{NHC}(\text{O})\text{OC}_2\text{H}_5]_2$. The infrared spectrum of the compound shows major absorption bands at the following wavelengths (expressed as cm^{-1}): 3380, 2460, 1700, 1460, 1330, 1300, 1280, 1205, 1160, 1090, 1055, 1020, 1010, 965, 950, 890, 870, 825, 795, 780, 725 and 860.

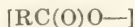
Analysis.—Calcd. for $[(\text{CH}_3)_4\text{N}]_2\text{B}_{12}\text{H}_{10}[\text{NHC}(\text{O})\text{OC}_2\text{H}_5]_2$ (percent): C, 36.3; H, 10.1; B, 27.9; N, 12.1. Found (percent): C, 36.3; H, 10.4; B, 28.2; N, 12.2.

The preceding examples illustrate broadly the substitution, replacement and metathetic reactions which the $B_{12}H_{12}^{-2}$ anion undergoes, employing techniques which are in many cases appropriate for effecting replacement of hydrogen bonded to carbon of a benzene nucleus. The substitution reactions used for carbocyclic aromatic compounds may be employed or modifications of these reactions can be used. Versatile intermediates, illustrated in the examples, are employed in many cases. Thus, dodecaborate derivatives bearing sulfo groups ($-SO_3H$) may be obtained by reacting dihydrogen dodecahydrododecaborate (2^-) with a sulfonating agent, e.g., chlorosulfonic acid, liquid sulfur trioxide, fuming sulfuric acid and the like. The sulfo-substituted products, e.g., $H_2B_{12}H_{11}SO_3H$ can be neutralized with bases or basic salts ($NaOH$, Na_2CO_3 , NH_4OH , NH_2NH_2 , and the like) to obtain salts such as $Na_2B_{12}H_{11}SO_3Na$, $(NH_4)_2B_{12}H_{11}SO_3NH_4$, and $(NH_2NH_3)_2B_{12}H_{11}SO_3NH_3NH_2$. Compounds bearing sulfonic groups can be reacted with phosphorus halides, e.g., PCl_5 , to obtain products bearing sulfonyl chloride groups, as illustrated by the compound $H_2B_{12}H_{11}SO_2Cl$. The sulfonyl chlorides can be reacted with ammonia or amines to obtain products bearing sulfamyl group, e.g., $(NH_4)_2B_{12}H_{11}SO_2NH_2$ and $[(CH_3)_2NH]_2B_{12}H_{11}SO_2N(CH_3)_2$.

Compounds bearing amine, hydroxyl and isocyanate groups have been described in the examples. The substituent groups in these compounds, i.e., the $-NH_2$, $-OH$, and $-NCO$ groups, undergo the same or similar types of reactions as their counterparts in organic chemistry. Thus, the organic Chemistry of aromatic amines, phenols and isocyanates can be applied to the corresponding boron compounds to obtain a broad range of products bearing desired substituents. To illustrate, a compound bearing $-NH_2$ groups can be reacted with (1) an isocyanate to form products having ureido or ureylene substituents, e.g., $Na_2B_{12}H_{10}(NH_2)_2$ is reacted with C_6H_5NCO to form $Na_2B_{12}H_{10}[NHC(O)NHC_6H_5]_2$, (2) with isothiocyanates to obtain products bearing thioureido or thioureylene groups, $Na_2B_{12}H_{10}(NH_2)_2$ can be reacted with C_6H_5NCS to obtain $Na_2B_{12}H_{10}[NHC(S)NHC_6H_5]_2$, (3) with sulfonyl chlorides to obtain products which bear sulfamino groups, e.g., $Na_2B_{12}H_{10}(NH_2)_2$ can be reacted with $C_6H_5SO_2Cl$ to obtain $Na_2B_{12}H_{10}(NH_2)_2[SO_2C_6H_5]_2$, and (4) with oxiranes to obtain hydroxyhydrocarbyl-amino-substituted compounds, e.g., $Na_2B_{12}H_{10}(NH_2)_2$ can be reacted with glycidol to obtain $Na_2B_{12}H_{10}[NHCH_2CH(OH)CH_2OH]_2$.

The amino-substituted dodecaborates can be reacted, as described earlier, with acid anhydrides or carbacyl halides to form compounds having amide groups bonded through the nitrogen to the dodecaborate anion. To illustrate, $H_2B_{12}H_{10}(NH_2)_2$ can be reacted with acetic anhydride to form $H_2B_{12}H_{10}[NHC(O)CH_3]_2$, with $C_6H_5C(O)Cl$ to form $H_2B_{12}H_{10}[NHC(O)C_6H_5]_2$ and the like.

As further illustrations, compounds of the invention which bear $-OH$ groups can be reacted, as described above for the amine-substituted compounds, with isocyanates, isothiocyanates, carbacyl halides, carbamyl halides, sulfonyl halides and oxiranes to obtain products which bear, e.g., N-substituted carbamoyloxy groups $[RNHC(O)O-]$ and $[R_2NC(O)O-]$, N-substituted thiocarbamoyloxy groups $[RNHC(S)O-]$ and $[R_2NC(S)O-]$, hydrocarbonyloxy groups



sulfonyloxy groups $[RS(O)_2O-]$ and hydroxyl-bearing ether groups. To illustrate, by reacting $Cs_2B_{12}H_{11}OH$ (1) with C_2H_5NCO , the compound $Cs_2B_{12}H_{11}OC(O)NHC_2H_5$ can be obtained, (2) with C_6H_5NCS , the compound $Cs_2B_{12}H_{11}OC(S)NHC_6H_5$ can be obtained, (3) with acetyl chloride, the compound $Cs_2B_{12}H_{11}OC(O)CH_3$ can be obtained (4) with $CH_3C_6H_4SO_2Cl$, the compound $Cs_2B_{12}H_{11}OSO_2C_6H_4CH_3$ can be obtained and (5) with ethylene oxide, the compound $Cs_2B_{12}H_{11}OCH_2CH_2OH$ can be obtained.

The preparation of compounds bearing from 1-12 hydroxyl groups was illustrated earlier in the examples. These products provide a fertile source of reagents to obtain compounds of Formula 1 bearing from 1-12 substituents by reactions which have been described above.

Compounds of Formula 1 in which X represents one or more $-NCO$ groups can be reacted with alcohols, mercaptans, ammonia, amines, and the like to obtain products bearing $-NHC(O)OR$, $-NHC(O)SR$, $-NHC(O)NH_2$, $-NHC(O)NHR$, $-NHC(O)NR_2$, and like substituents.

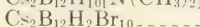
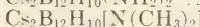
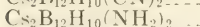
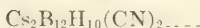
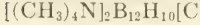
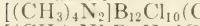
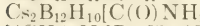
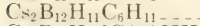
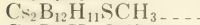
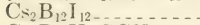
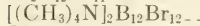
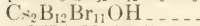
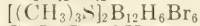
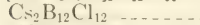
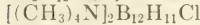
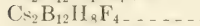
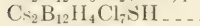
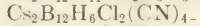
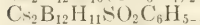
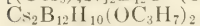
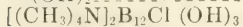
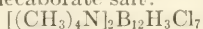
The nitro-substituted dodecaborate compounds can be reduced with hydrogen to amino-substituted dodecaborates, i.e., compounds of the general formula $M-[B_{12}H_{12-y}(NH_2)_y]_n$, where M, a, b and y are defined as in Formula 1. Conventional processes employing iron and a mineral acid are satisfactory for use in the

reduction step. To illustrate, by reduction of the appropriate nitro derivative, there can be obtained $(\text{NH}_4)_2\text{B}_{12}\text{Cl}_6(\text{NH}_2)_6$, $\text{Na}_2\text{B}_{12}\text{H}_6(\text{NH}_2)_6$, $\text{Cs}_2\text{B}_{12}\text{H}_9(\text{NH}_2)_3$, $\text{C}[\text{CH}_3]_4\text{H}_{11}\text{NH}_2$, and the like.

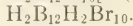
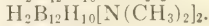
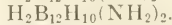
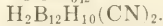
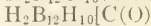
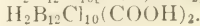
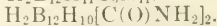
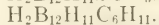
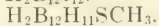
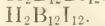
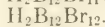
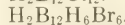
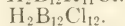
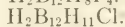
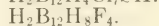
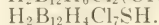
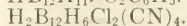
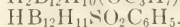
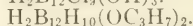
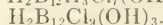
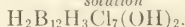
Acids of the formula $\text{H}_2\text{B}_{12}\text{H}_{12-y}\text{X}_y$ are obtained as described earlier, most conveniently by contacting an aqueous solution of a dodecaborate (2^-) salt with an acid ion-exchange resin. The hydrogen ions, i.e., $(\text{H}^+)_2$, are considered to be hydrated in aqueous solution and they are generally referred to as hydronium ions, i.e., $(\text{H}_3\text{O}^+)_2$. The terms "hydrogen ion" and "hydronium ion," are employed herein in their generic sense as defined on p. 26 of "Nomenclature of Inorganic Chemistry—International Union of Pure and Applied Chemistry" which was referred to earlier.

In the operation of this process for preparing acids, aqueous or methanol solutions of dodecaborate (2^-) salts are passed through a column filled with an acid ion-exchange resin of the crosslinked polystyrenesulfonic acid type. These resins are available commercially. The aqueous or alcoholic effluents are solutions of the free acids. Careful concentration of the solutions and intensive drying of the liquid residues under low pressures and at moderate temperatures usually yields the acids as crystalline hydrates. However, for most purposes, it is convenient to use the acid in aqueous or alcoholic solutions and the acids are preferably stored in solution. By using the process as described above, the following acids can be obtained from the named representative dodecaborate salts.

Dodecaborate salt:



Acid obtained in aqueous solution



Metal salts of the invention can be prepared by neutralization of the acids, obtained as described above, in aqueous or alcohol solution with an aqueous solution or suspension of an inorganic base, e.g., an alkali or alkaline earth metal hydroxide. The resulting aqueous solution of the metal salt of the $(\text{B}_{12}\text{H}_{12-y}\text{X}_y)^{-2}$ anion is concentrated by evaporation of water or alcohol until the salt crystallizes out. In many cases the salt may precipitate during its preparation and evaporation of the solution is not necessary. The crystalline salt is dried under reduced pressure, e.g., 0.1 mm. of mercury, and moderately elevated temperature, e.g., 50–100° C. The metal salts frequently contain water of hydration which can be removed by heating for several hours at a temperature of about 200° C. under low pressure, e.g., 0.1 mm. of mercury or lower.

Water-insoluble heavy metal salts of the acids can be prepared by adding a water-soluble heavy metal salt, e.g., silver nitrate or mercuric nitrate, to an aqueous solution of the boron-containing acid. Silver salts can also be obtained by shaking aqueous solutions of the acids with freshly prepared silver oxide. The heavy metal salts precipitate as white or light-colored solids. The salts thus obtained are usually anhydrous.

Nitrates, carbonates, chlorides, or oxides of metals can be used to prepare the salts by the methods described earlier. Organic bases, e.g., amines, tetra-substituted ammonium hydroxides, phosphonium hydroxides, sulfonium hydroxides, arsonium hydroxides or halides, stibonium hydroxides or halides, arylidiazonium hydroxides or halides, amino acids (e.g., glycine), esters of amino acids, and similar types of bases can be employed. Heterocyclic bases, e.g., pyridine, quinine, α, α' -dipyridyl, piperazine, pyrrolidine, phenazine, morpholine, thiamorpholine and the like, are operable to form salts.

The following table illustrates representative salts which can be obtained by neutralizing the acids with a base or an appropriate salt in aqueous solution (Table IV):

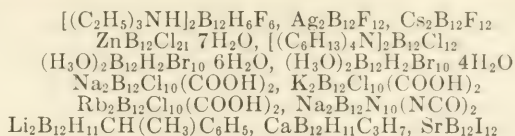
TABLE IV

Acid	Neutralizing agent	Product
$H_2B_{12}H_{10}(NH_2)_2$	LiOH	$Li_2B_{12}H_{10}(NH_2)_2$
$H_2B_{12}H_{10}(NH_2)_2$	$Ba(OH)_2$	$BaB_{12}H_{10}(NH_2)_2$
$H_2B_{12}H_7Cl_3(OH)_2$	$MgCO_3$	$MgB_{12}H_7Cl_3(OH)_2$
$H_2B_{12}Cl_9(OH)_2$	$La_2(CO_3)_3$	$[La(H_2O)_6]_2[B_{12}Cl_9(OH)_3]$
$H_2B_{12}H_{10}(OC_6H_7)_2$	$Al(OH)_3$	$[Al(H_2O)_6]_2[B_{12}H_{10}(OC_6H_7)_2]_3$
$H_2B_{12}H_{11}SO_4C_6H_5$	$MnCl_2$	$Mn(H_2O)_6[B_{12}H_{11}SO_4C_6H_5]$
$H_2B_{12}H_5Cl_2(CN)_4$	$FeCl_3$	$[Fe(H_2O)_6]_2[B_{12}H_5Cl_2(CN)_4]_3$
$H_2B_{12}H_4Cl_2SH$	$Co(OH)_2$	$Co(H_2O)_6[B_{12}H_4Cl_2SH]$
$H_2B_{12}H_5F_4$	$Ni(OH)_2$	$NiB_{12}H_5F_4$
$H_2B_{12}H_{11}Cl$	Ag_2O	$Ag_2B_{12}H_{11}Cl$
$H_2B_{12}Cl_{12}$	CuO	$Cu(H_2O)_4B_{12}Cl_{12}$
$H_2B_{12}H_6Br_6$	$ZnCl_2$	$Zn(H_2O)_4B_{12}H_6Br_6$
$H_2B_{12}Br_{11}OH$	$HgCl_2$	$HgB_{12}Br_{11}OH$
$H_2B_{12}Br_{12}$	$AlCl_3 \cdot 6H_2O$	$[Al(H_2O)_6]_2(B_{12}Br_{12})_3$
$H_2B_{12}I_{12}$	$SnCl_2$	$SnB_{12}I_{12}$
$H_2B_{12}H_{11}SCH_3$	$PbCl_2$	$PbB_{12}H_{11}SCH_3$
$H_2B_{12}H_{11}C_6H_{11}$	$EuCl_3$	$[Eu(H_2O)_6]_2(B_{12}H_{11}C_6H_{11})_3$
$H_2B_{12}H_5F_4$	NH_2NH_2	$[NH_2NH]_2(B_{12}H_5F_4)$
$H_2B_{12}H_{10}(C(O)NH_2)_2$	$(CH_3)_2NNH_2$	$[(CH_3)_2NNH]_2[B_{12}H_{10}(C(O)NH_2)_2]$
$H_2B_{12}Cl_{12}$	$(C_6H_5)_2NH$	$[(C_6H_5)_2NH]_2B_{12}Cl_{12}$
$H_2B_{12}H_{10}(CN)_2$	$(C_6H_5)_3N$	$[(C_6H_5)_3N]_2B_{12}H_{10}(CN)_2$
$H_2B_{12}Cl_{12}$	C_9H_7N (quinoline)	$[C_9H_7NH]_2B_{12}Cl_{12}$
$H_2B_{12}Cl_{12}$	ZnO	$ZnB_{12}Cl_{12}$
$H_2B_{12}H_{10}(CN)_2$	$Zn(NH_4)Cl_2$	$Zn(NH_4)_4B_{12}H_{10}(CN)_2$
$C_2B_{12}H_{11}SCH_3$	$(CH_3)_3SOH$	$[(CH_3)_3S]_2B_{12}H_{11}SCH_3$
$H_2B_{12}Cl_{10}(COOH)_2$	$C_6H_5N=NCl$	$[C_6H_5N=N]_2B_{12}Cl_{10}(COOH)_2$
$C_2B_{12}Br_{11}OH$	$(C_6H_5)_4PCl$	$[(C_6H_5)_4P]_2B_{12}Br_{11}OH$
$H_2B_{12}Cl_{12}$	NH_2CH_2COOH	$[NH_2CH_2COO]_2B_{12}Cl_{12}$
$H_2B_{12}Cl_9(OH)_3$	$CeCl_3$	$[Ce(H_2O)_6]_2[B_{12}Cl_9(OH)_3]_3$
$H_2B_{12}I_{12}$	$C_5H_5NCl(C_6H_5)_3$	$[C_5H_5N(C_6H_5)_3]_2B_{12}I_{12}$
$H_2B_{12}H_{10}(CN)_2$	$[Co(en)_3]Cl_2$	$[Co(en)_3]_2B_{12}H_{10}(CN)_2$
$H_2B_{12}Cl_{12}$	$(CH_3)_4AsI$	$[(CH_3)_4As]_2B_{12}Cl_{12}$
$H_2B_{12}H_7Br_{10}$	$AgNO_3$	$Ag_2B_{12}H_7Br_{10}$

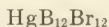
en=ethylenediamine.

The process described above and illustrated in the examples are generic for the preparation of compounds of the invention as defined by Formula 1. The processes can be used alone or in combination to obtain the desired products. For example, H_2S can be reacted, as described in Example 36; with hydrated $H_{12}B_{12}H_8Cl_4$ to obtain $H_2B_{12}H_6Cl_4(SH)_2$, with $H_2B_{12}H_8(OH)_4$ to obtain a mixture of thiol substituted compounds, e.g. $H_2B_{12}H_4(OH)_4(SH)_4$ and $H_2B_{12}H_6(OH)_4(SH)_2$ with $H_2B_{12}H_{11}F$ to obtain $H_2B_{12}H_8F(SH)_3$ and with $H_2B_{12}H_{10}(OCH_3)_2$ to obtain $H_2B_{12}H_8(SH)_2(OCH_3)_2$. Similarly, hydrated $H_{12}B_{12}H_{12}$ can be reacted as described in Example 13, parts D and E, with long chain α -dihydro- and α, α, α -trihydroperfluoroalkanols, e.g. $CF_3(CF_2)_5CH_2OH$, $HCF_2(CF_2)_3CH_2OH$, $HCF_2(CF_2)_5CH_2OH$, and $HCF_2(CF_2)_7CH_2OH$ to obtain fluoroalkoxy substituted dodecaborates, e.g., $H_2B_{12}H_{10}[OCH_2(CF_2)_5CF_3]_2$, $H_2B_{12}H_{11}OCH_2(CF_2)_3CF_2H$, $H_2B_{12}H_{10}[OCH_2(CF_2)_5CF_2H]_2$, $Li_2B_{12}H_{11}(CH_3)C_6H_5$, $CaB_{12}H_{11}C_3H_7$, $SrB_{12}H_{12}$, and $H_2B_{12}H_{11}OCH_2(CF_2)_7CF_2H$. Polychloropolyfluoroalkanols can be employed in the reaction, e.g., $ClF_2CCF_2CFClCF_2CF_2CH_2OH$, to obtain $H_2B_{12}H_{11}OCH_2CF_2CF_2CFClCF_2CF_2Cl$. Mono-cyano substituted compounds can be obtained by contacting the crude reaction product obtained in Example E with liquid ammonia to prepare $C_2B_{12}H_{11}C(O)NH_2$ and dehydrating the monoamide, as described in Example 37, part A, to obtain $C_2B_{12}H_{11}CN$. Reaction of this compound with $C_6H_5CH_2SSCH_2C_6H_5$, as described in Example 8, part A, will yield $C_2B_{12}H_9(SCH_2C_6H_5)_2CN$, a compound which can then be brominated as described in Example 3, part C, to obtain $C_2B_{12}H_3Br_3(SCH_2C_6H_5)_2CN$.

Further examples which illustrate the products obtained by the described processes are



and



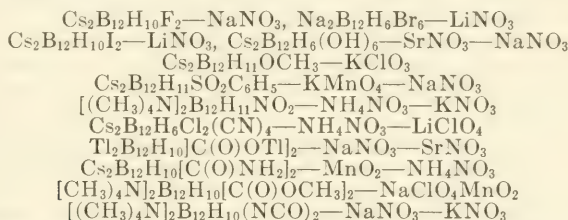
The illustrations in the preceding paragraphs demonstrate the generic nature of the processes and their versatility to obtain a wide range of products which fall within the scope of the compounds of the invention.

Utility

The invention provides a broad class of new boron compounds which find applications in many fields.

The compounds of the invention are generically useful as components of fireworks compositions to impart a pleasing color and sparkle to the display.

Each compound within the scope of Formula 1 contains an anion which has boron as a common component. The presence of this element imparts a green color to a fireworks, rocket or flare display. The compounds of the invention can have a wide range of cations, designated as M, and it is thus possible to provide a broad range of colors in any display or flare by choice of the appropriate cation. The compounds of the invention can be used in combination with oxidizing agents, e.g., lithium perchlorate, sodium nitrate, potassium permanganate, strontium peroxide, manganese dioxide, and the like, to provide the desired propulsive effect and color. The following combinations, in which the boron-containing compounds can be from 5-25% by weight of the composition, are illustrative of compositions which can be used:



and the like. These examples are not limiting but are illustrative of types of compositions which are possible for use in the above field. Other ingredients can be and frequently are present in these combinations, e.g., carbon and sulfur.

The compounds of the invention are useful in the field of high energy fuels. For this purpose, partially substituted compounds are preferred, i.e., compounds having one to five substituents on the dodecarborate anion. The compounds can be used in combination with oxidizing agents, e.g., nitric acid, fluorine oxide and the like. They can be used in solution in hydrazine or N,N-dialkyl hydrazines, e.g., N,N-dimethylhydrazine. To illustrate, combinations which can be employed include $H_2B_{12}H_{10}[C(O)NH_2]_2$ in N,N-dimethylhydrazine, $(NH_2NH_3)_2B_{12}H_{11}OH$ in hydrazine and the like. The acids in the above examples form hydrazinium salts in solution and they are not present as the free acids. In compositions as described above the dodecarborate salt can be present in from about 5-50% by weight of the solutions.

The compounds of the invention, exclusive of the fully halogenated products, are useful as impregnating agents in the preparation of resistors. To illustrate, a section of a cotton string is immersed in a nearly saturated solution of $Na_2B_{12}H_{11}CH(CH_3)_2$ in aqueous alcohol. The string is withdrawn from the solution and the solvent is removed by drying in air. A free flame is applied to the dried impregnated string and it burns to yield a coherent ash which in size and shape resembles the original string. The residual skeleton is of sufficient coherence to permit embedding in paraffin. The section of residue, so treated, shows a resistance of about 300 ohms/cm. The residue from the control section of string is very small and shapeless and it cannot be handled.

Highly halogenated compounds, e.g., the salts of $B_{12}Br_{12}$ anion, are useful as impregnating agents for retarding the combustion of cellulosic products. To illustrate, filter paper which has been treated with an aqueous solution of $(NH_4)_2B_{12}Br_{12}$ and dried, does not burn freely when touched with a free flame.

The nitrated and nitroso-substituted compounds are useful as explosives or detonating agents.

In the group of compounds which fall within the scope of Formula 1, the component M represents a range of groups which are readily interchangeable by metathetic reactions as described earlier. All of the salts which fall within the scope of Formula 1 can be used to prepare the group of acids represented generically as $H_2B_{12}H_{12-y}X_y$ or, in aqueous solution, as $(H_3O)_2B_{12}H_{12-y}X_y$ by passing aqueous or alcoholic solutions of the salts through an acidic ion-exchange resin as described earlier. The acids of this group, exclusive of compounds in which X is an amine group, are strong acids and they are useful in industrial applications where it is desired to avoid contamination from sulfate, chloride, bromide, chlorate, phosphate, and like strong acid anions. Thus, the acids are useful for etching metals, such as steel, and for rust removal, for pickling, for scale removal and for similar metal processing operations.

The acids, described above, are useful as catalysts in the preparation of esters, e.g., in the reaction of alcohols and organic carboxylic acids, to improve the yields of the desired esters. The acids of the invention are employed for this purpose in the same manner as p-toluene-sulfonic acid, sulfuric acid or alcoholic hydrogen chloride.

Aqueous solutions of the acids are generically useful as agents for absorbing noxious basic materials from the air, e.g., traces of ammonia, lower alkyl amines and the like. To illustrate, air contaminated with methylamines is passed through an aqueous solution of $H_2B_{12}H_{10}(OH)_2$, $H_2B_{12}H_{10}(OCH_3)_2$, $H_2B_{12}Cl_{12}$, and the like, and the amines are removed.

The acids and many of the salts, particularly the alkali metal and alkaline earth metal salts, are useful as sequestering agents for heavy metals. Thus, a mixture of hydrocarbons in the boiling range of gasoline which contains a copper salt of an organic acid (copper stearate), is thoroughly agitated with aqueous ammoniacal solutions of any of the alkali metal or alkaline earth metal salts of the anion $(B_{12}H_{12-y})^{-2}$, e.g., $Cs_2B_{12}H_{11}SO_2C_6H_5$, $Na_2B_{12}H_{10}(OH)_2$.

The new compounds, particularly the acids, alkali and the like. The hydrocarbon layer, which is separated from the aqueous reagent, is completely free of deleterious copper salt.

The new compound, particularly the acids, alkali metal, alkaline earth metal and ammonia salts, are useful as sequestering agents for metals in aqueous media. Thus, copper, nickel, cobalt, zinc and cadmium are removed from aqueous solutions of salts containing these metals by mixing the solutions with ammoniacal solutions of the acids and alkali metal, alkaline earth metal and ammonium salts.

The substituted ammonium salts and, in general, all of the nitrogen-base salts as well as phosphonium and sulfonium salts are useful in the field of sequestering agents to remove undesirable metals from aqueous or hydrocarbon media.

To illustrate, a mixture of hydrocarbons in the boiling range of gasoline, which contains in solution a copper salt of an organic acid (copper stearate), is thoroughly agitated with an aqueous ammoniacal solution of $NaB_{12}H_2Cl_{10}$. The hydrocarbon layer, which is separated from the aqueous reagent, is completely free of the deleterious copper salt. Similar results can be obtained employing $[(CH_3)_4N]_2B_{12}H_{10}[OC(O)H]_2$, $Cs_2B_{12}H_{11}OCH_2CH_2OCH_3$, and the like.

The compounds of the invention, especially in the form of salts, are useful as surface-active agents, particularly as wetting agents. To illustrate, a glass surface coated with a film of a silicone is not wetted when brought into contact with water. The addition of a small quantity of dicesium cyclohexylundecahydrododecaborate to the water results in immediate wetting of the glass surface, i.e., the treated water spreads rapidly over the surface of the glass.

The silver salts, i.e., the compounds of Formula 1, where M is Ag, are sensitive to light and they are useful in the photographic arts. To illustrate, the cesium salt, $Cs_2B_{12}H_{11}OC(O)H$, is reacted with silver nitrate to obtain $Ag_2B_{12}H_{11}OC(O)H$. An alcoholic solution of the silver salt is prepared in subdued light and a strip of pure cellulose sheet is immersed to half its length in the solution. The strip is removed and dried in the absence of light. When exposed to light, the treated pure cellulose sheet is immersed to half its length in the solution. The strip is portion of the strip turns dark, while the untreated portion is not affected.

The foregoing detailed description has been given for clearness of understanding only and no unnecessary limitations are to be understood therefrom. The inven-

tion is not limited to the exact details shown and described, for obvious modifications will occur to those skilled in the art.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A compound of the formula $M_a(B_{12}H_{12-y}X_y)_b$ wherein M is a cation having a valence of 1-4; X is a monovalent element other than hydrogen, or a radical, said X being capable of bonding to the carbon of a benzene nucleus by replacement of a hydrogen bonded to said carbon; and when more than one X group is present the X's can be different; y is a positive whole number of 1 through 12, inclusive; and a and b are positive whole numbers of 1 through 3, inclusive.

2. A compound of claim 1 wherein X comprises halogen.

3. A compound of claim 1 wherein X comprises hydrocarbon.

4. A compound of claim 1 wherein X comprises acyl.

5. A compound of claim 1 wherein X comprises nitro.

6. A compound of claim 1 wherein X comprises amino.

7. A compound of claim 1 wherein X comprises hydroxyl.

8. A compound of claim 1 wherein X comprises carboxyl.

9. A compound of claim 1 wherein X comprises isocyanato.

10. A compound of claim 1 wherein X comprises hydrocarbyloxy.

11. A compound of claim 1 wherein X comprises halohydrocarbyloxy.

12. A compound of claim 1 wherein X comprises hydrocarbyloxyhydrocarbyloxy.

13. A compound of claim 1 wherein X comprises hydroxylhydrocarbyloxy.

14. A compound of claim 1 wherein X comprises hydrocarboncarbonyloxy.

15. A compound of claim 1 wherein X comprises cyano.

16. A compound of claim 1 wherein X comprises hydrocarbyloxy carbonyl.

17. A compound of claim 1 wherein X comprises carbamyl.

18. A compound of claim 1 wherein X comprises thiol.

19. A compound of claim 1 wherein X comprises hydrocarbylmercapto.

20. A compound of the formula $M_2[B_{12}H_{10}(COOH)_2]$ wherein M is a cation selected from the class consisting of hydrogen, alkali metals, and tetramethylammonium.

21. A compound of the formula $M_2[B_{12}H_{10}(NH_2)_2]$ wherein M is a cation selected from the class consisting of hydrogen, alkali metals, and tetramethylammonium.

22. A compound of the formula $M_2B_{12}Cl_{12}$ wherein M is a cation selected from the class consisting of hydrogen, alkali metals, and tetramethylammonium.

23. A compound of the formula $M_2B_{12}(OH)_{12}$ wherein M is selected from the class consisting of hydrogen, alkali metals, ammonium and tetramethylammonium.

24. A compound of the formula $M_2B_{12}H_{10}(NCO)_2$ wherein M is selected from the class consisting of alkali metals and tetramethylammonium.

25. A compound selected from the class consisting of $H_2B_{12}Cl_{12}$ and hydrates thereof.

26. A compound selected from the class consisting of $H_2B_{12}Br_{12}$ and hydrates thereof.

27. A compound selected from the class consisting of $H_2B_{12}I_{12}$ and hydrates thereof.

28. The compound of the formula $Ag_2B_{12}Cl_{12}$.

29. The compound of the formula $Ag_2B_{12}Br_{12}$.

30. The compound of the formula $Ag_2B_{12}I_{12}$.

31. The compound of the formula

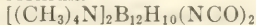


32. The compound of the formula $Cs_2B_{12}H_{10}(SCH_3)_2$.

33. The compound of the formula



34. The compound of the formula



35. A compound of the formula $M_2(B_{12}H_{12-y}X_y)_b$ wherein M is a cation having a valence of 1-4; X is a monovalent substituent selected from the group consisting of halogen, hydrocarbon, acyl, nitro, amino, hydroxyl, carboxyl, isocyanato, hydrocarbyloxy, halohydrocarbyloxy, hydrocarbyloxyhydrocarbyloxy, hydroxyhydrocarbyloxy, hydrocarboncarbonyloxy, cyano, hydrocarbyloxy carbonyl and carbamyl; and when more than one X group is present the X's can be different; y is a positive whole number of 1 through 12, inclusive; and a and b are positive whole numbers of 1 through 3, inclusive.

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G. O. PETERS, Assistant Examiner

U.S. Cl. X.R.

23—361; 260—606.5

EXHIBIT D

REPLACEMENT PENDING

Major changes in Patent Office operating methods are likely to result from the recent forced resignation of U.S. Commissioner of Patents Robert Gottschalk. Gottschalk was eased out for several reasons, including a tendency to bypass the assistant commissioners.

Morale at the Patent Office reportedly has improved since Gottschalk left, but organizationally the agency is in a shambles. The jobs of deputy commissioner, assistant commissioner for legal affairs and assistant commissioner for patent examination—all key posts—are unfilled.

Moreover, the research and development office, which Gottschalk downgraded, is mired in a squabble with the NATIONAL Bureau of Standards over electronic methods of storing and retrieving technical information. Gottschalk's predecessor, William Schuyler, established the R&D unit under an assistant commissioner. But Gottschalk eliminated that post and the operation went downhill.

Seeking Replacement: A successor for the job is not likely to be named until fall. Betsy Ancker-Johnson, Assistant Secretary of Commerce for Science and Technology, has been searching the business and legal communities for a replacement. Some observers, however, say the available talent is thin.

Two women have been mentioned as candidates—Washington patent attorneys Margaret Lawrence and Mary Sears. Both are available for the post and could find favor with Ancker-Johnson, an outspoken proponent of high-ranking jobs for women.

The job of commissioner calls for strong managerial capabilities—a trait considered scarce among patent lawyers. Former Assistant Commissioner Richard Wall, who resigned last month in a dispute with Gottschalk, says, "The next commissioner has to be a good administrator or show signs of becoming one. To bring in someone just because he is backed by the patent bar isn't adequate anymore."

Gottschalk and Wall had wrangled over policies affecting the patent examining corps. They also had personality differences. Gottschalk wanted to eliminate Wall's system of setting quotas for patent examiners and rewarding them for exceeding their targets. Under that system, patent pendency time dropped from 31 months to 24—and Wall claims it could have been down to 18 months within three years.

Gottschalk, claiming that quotas were bad for workers' morale, preferred to rely on the old-fashioned sense of professionalism.

The acting Patent Office chief is Rene Tetgmeyer, a former assistant commissioner for legal affairs. But Ancker-Johnson is handling the upper-level policy matters as well as fighting off moves in Congress, led by Senator John

McClellan (D., Ark.), to raise the rank of Commissioner of Patents to the Assistant Secretary of Commerce level. Such a step would considerably weaken the administration domain of Ancker-Johnson at a time when she is trying to gain policy leverage in the department.

Exhibit E

U.S. DEPARTMENT OF COMMERCE,
PATENT OFFICE,

Washington, D.C., August 14, 1970.

Subject: Review of Fiscal Year 1970 and Plans for Fiscal Year 1971.

To: All Patent Examining Employees.

Attached hereto for your reading are copies of talks given on August 5 to the management people in my area of responsibility, Patent Examining.

The talks were given by: Mr. Frank Bronaugh, Deputy Assistant Commissioner for Patent Examining. Mr. George Boys, Chairman, Board of Patent Interferences. Mr. Ed Hart, Director, Office of Support Services.

The talks review our accomplishments during Fiscal Year 1970 and highlight our programs and goals for Fiscal Year 1971 and beyond.

Attachments.

RICHARD A. WAHL,
Assistant Commissioner.

PATENT EXAMINING BY F. H. BRONAUGH

I wish to take this opportunity to review the program accomplishment of the Examining Groups for FY 1970, to re-emphasize the Program for FY 1971 and discuss a few problem situations.

PROGRAM ACCOMPLISHMENT FOR FISCAL YEAR 1970

For a number of years the goal of the Examining Corps has been to take applications up for action in the order of their effective filing date and reduce the pendency of normal patent applications to eighteen (18) months.

In developing a program to achieve the aforementioned eighteen (18) months pendency goal a number of subordinate goals have been established and the degree of attainment of the subordinate goals indicate the progress toward attaining the eighteen (18) months pendency goal.

Important subordinate goals relate to (1) reduction in delay to first action, (2) reduction in delay to reconsideration of those applications in which reconsideration has been requested, (3) disposing of applications at a rate in excess of the receipt of new applications and (4) giving first actions at a rate that will result in the required rate of disposals.

The attachment discloses the Examining Group achievement during FY 1970 and the aforementioned subordinate goals.

1. Reduction in delay to first action: In order to ensure that an application is disposed of within eighteen (18) months a first action should generally be given between seven (7) and nine (9) months from the day of filing. Consequently goals for reducing the delay to first action have been established. It appears that there is no uniformity of goals throughout the Examining Groups as to the goal for maximum delay to first action by June 30, 1970. However, the goal for Mechanical Examining Groups was twelve (12) months maximum delay by June 30, 1970. In view of the large number of first actions given by all Examining Groups during the last several years compared to receipts of new applications this goal would appear to be a reasonable goal for all Examining Groups. During FY 1970, Groups 210 and 340 attained this goal.

2. Reduction in delays to reconsideration: In order to further reduce pendency delay another subordinate goal of taking up for reconsideration an application within two (2) months of the request for reconsideration was established. Groups 110, 310, 320 and 340 attained this goal.

3. Disposals: The backlog of pending applications is related to the reduction in pendency time since the reduction in the number of pending applications will render the eighteen (18) months pendency of applications more readily attainable. Accordingly Disposal goals related to backlogs and rate of receipts of new applications were established. Groups 160, 210, 230, 250, 290, 310, 320

and 350 attained these goals. However, during FY 1970 it was difficult to operate with planned staffing and planned examining time. Accordingly compensated goals based upon available examining time were developed. Groups 170, 210, 220, 250, 290, 310, 320 and 350 attained these goals.

4. First actions: In addition, first action goals related to backlogs and rate of receipts of new applications were established. Groups 120, 140, 160, 170, 210, 220, 230, 250, 280, 310, 320, 330, 340 and 350 attained these goals. In view of the staffing and examining time problems noted above compensated goals based upon available examining time were developed. Groups 140, 160, 170, 210, 220, 230, 290, 310, 320, 330, 340 and 350 attained these goals.

The overall performance of the Examining Groups for FY 1970 was satisfactory. The performance with respect to Disposals and First Actions was outstanding. However, there is evidence that delays in taking applications up for action in the order of their filing date or date of request for reconsideration is a problem in many Examining Groups. I recognize that the reported delays in acting upon new applications represent maximum rather than average delays. However, we cannot ignore problems by referring to averages.

PENDENCY REDUCTION PROGRAM FOR FY 1971

The Patent Office must reduce the time of pendency of an application to a minimum consistent with a reasonable evaluation of the invention to which the application pertains in light of prior knowledge and applicable patent laws. A short pendency assures relative prompt determination of the rights of the inventor and relative rapid disclosure to the public of such technical information as is contained in an application.

A current goal is to normally dispose of an application within 18 months from the date the application was filed. An application is disposed of when the patent resulting therefrom issues or when the application becomes abandoned by failure of the applicant to continue prosecution or submit essential fees within statutory time limits. It should be recognized that while an examiner is credited with a disposal at the time he passes an application for issue, the Office does not consider the application disposed of until the date the patent issues.

It is therefore essential to develop a program whereby an application is normally disposed of within 18 months of its filing date. The examination of an application is based upon the right of an applicant to an examination and a reexamination, if requested. Also the majority of applications result in patents. Therefore, a program to normally dispose of an application within 18 months must contemplate time for two (2) Office actions, the payment of the issue fee, and the printing of the patent.

It is recognized that many applications are disposed of with one (1) Office action and other applications require more than two (2) Office actions. It is also recognized that an application which becomes involved in an appeal, interference, public use proceeding, or combination thereof cannot be expected to be disposed of within 18 months from the filing date.

In order to normally dispose of an application within 18 months from the filing date, it is necessary to establish a number of subordinate goals, as follows:

1. A new application should be taken up for action within approximately eight (8) months after filing. During FY 1971 the maximum delay to first action should be reduced to eleven (11) months.

2. A shortened period of three (3) months should be set for response to the normal Office action. During FY 1971, examiners should be reasonable in granting a one (1) month extension if requested by applicant. A further extension should be limited to exceptional situations.

3. An action in an application in which reexamination has been requested should be completed within one (1) month of the filing of the request for examination.

4. A second Office action should be made final in all but exceptional cases.

5. Any action required of an examiner in an application on appeal or in interference should be given within one (1) month of the step of the proceeding requiring such action.

The subordinate goal which currently offers the maximum reduction in pendency time is the reduction in delay to taking new applications up for action. On June 30, 1970, the maximum Group delays range from 12 to 29 months.

The Examining Groups reporting 12 months delay are on target with an established program for reducing pendency to first action and such achievement demonstrates that the schedule of the established program is attainable.

Production reports indicate that the Examining Groups have the productive capacity to materially reduce the reported delays to first action. For example, on June 28, 1969, there were reported 92,236 new applications docketed in the Examining Groups. During FY 1970, actions were given on 115,561 new applications. While a number of new applications filed subsequent to June 28, 1969 had authorized "Special" examination status and were properly taken up for action, it appears there should have resulted significantly larger reductions in the maximum delays to first action than were reported on June 30, 1970.

Docket activity reports indicate that in many Examining Groups there are substantial spreads between the filing dates of the oldest new applications awaiting action. On June 30, 1970, the spread is as high as eight (8) months. It appears that a reduction of this spread by concentrating on the oldest filed new applications would rapidly result in significant reductions in the reported maximum delays to first action. It is worth noting that the aforementioned Examining Groups reporting only 12 months maximum delay to first action are operating with less than a one (1) month spread between the filing dates of the oldest new applications.

Accordingly, a further subordinate goal is established as follows:

6. (To follow the 5 Subordinate goals noted above). Dockets should be adjusted to assure new applications are taken up for action with no more than a two (2) months spread with respect to filing date.

In order to attain a normal 18 months pendency, it is desirable to reduce the overall backlog of pending applications by initiating and terminating the examination of applications at a rate exceeding the rate of receipt of new applications, leads to additional subordinate goals as follows:

7. (To follow Subordinate goals noted above). First actions should exceed receipts of new applications as indicated by the assigned Group first action goal.

8. Disposals should exceed receipts of new applications as indicated by the assigned Group disposal goal.

The above noted primary goal and subordinate goals do not reserict the authority of the Directors to set additional goals consistent with the overall goal of normally disposing of an application within 18 months from the date the application was filed.

PROBLEM SITUATIONS

You are aware that a number of positions throughout the Patent Office are filled by detailing examiners to those positions for limited periods. This practice has been incorporated in the Career Development Program as details to many positions provide the examiners with a wider knowledge of the overall operation of the Patent Office. If an examiner is selected for one of these details the Supervisory Examiner and Director should cooperate with the Program. However, if too many examiners are selected for details from one Art Unit or one Examining Group for concurrent details this situation should be called to the attention of the selecting official with a view of deferring a detail to a future date.

Currently there are in progress a number of Information Retrieval Projects, some of which have been developed by the Patent Office and some have been requested by foreign Patent Offices under the ICIREPAT Program. The manpower for these projects is being supplied by the Examining Groups on the theory that the project will on completion assist the examiners in searching for prior art. * * *

RICHARD WOODBRIDGE*, PO. 1142

Years ago an ancient Greek innkeeper by the name of Procrustes invented the ultimate reference stretcher. He would torture his victims on an iron bed onto which each unfortunate was made to fit exactly. To insure this perfect fit Procrustes the Greek would stretch a victim if he were too short or cut his legs to size if he were too tall. To this garret entrepreneur the English language is indebted for the adjective "procrustean", which is defined by Webster as being "marked arbitrary and often ruthless disregard for individual differences or special circumstances."

* Examiner, Art Unit 254.

Thanks to the typewriter, secretaries, Ballerina ballpoints and modern technology in general it is now possible for the present day examiner to stretch his or her rejection into a length adequate to cover any first action examining situation. However, in a recent step backward into antiquity, the administration reinvented the modern equivalent of the procrustean bed—the new first action form PO-1142.

The most obvious shortcoming of PO-1142 is that it does not provide sufficient writing space in which to make the rejection. The space designated for identification of references, analysis of the application, application of the reference to the application conclusions as to obviousness, supporting reasons, indefiniteness, misdescriptiveness, general observations and comments, etc., is a Lilliputian sized box one inch deep by four inches long. This box is surgically further subdivided into six lines each one-sixth of an inch high. While this space may be sufficient for the 102 "Chiness Copy" situation, it is more often than not inadequate for the average 103 or 112 rejection and totally failing in more complicated situations. Imagine, for example, the frustration of an examiner trying to reject an applicant on the basis of two or more references. His first step is easy, he writes:

"It would be obvious to . . .", but then the examiner becomes seized with panic as he realizes that he has already used up one precious line and said exactly nothing. Feverishly his mind races for some simple way to abbreviate what he wants to say. What he writes usually comes out something like this:

"It would be obvious to make a fluted FRISBEE like A with synchronized stabilizers like B (see FIG. 8A) and powered by solar cells like C"

The lingering question begging to be answered is—WHY IS IT OBVIOUS? A few hints as to reasons may have been provided by reference to appropriate sections of the reference, but space is not provided in which to develop a full explanation of the sort rightfully expected from a professional grade employee of the United States Government. The examiner is left with the feeling that the administration is not interested in his opinion on patentability, but rather simply desires a quick search of the prior art in order to give the applicant something to define around. Understandably the examiner feels that his professional status has been undermined. Moreover, could you imagine the crisis in confidence that would ensue if Supreme Court Justices had to confine their opinions to the space afforded by a one inch by four inch rectangle? *Brown v. Board of Education* would be reduced to the area of four and a half eight cent stamps. Also, imagine the file wrapper record history upon which future litigants have to rely. One can just see a Supreme Court justice throwing up his hands in despair when he discovers that the initial paper of the record consists of several barely legible conclusions as to possible patentability, and little or no objective reasoning offered to support those conclusions. What can he hang his hat on. Not only is it difficult for others to understand the examiner, but is is often difficult for the examiner himself to reconstruct his thinking when confronted with the applicant's response to PO-1142.

On at least one occasion a PO-1142 has been returned to the Patent Office with a request for clarifications and extensions of time to respond because the carbon copy was barely legible and did not lend itself to photoduplication. Many attorneys send a Xerox of the examiner's rejections to the applicant as a normal part of their operating procedure. Clearly the applicant is not impressed when he receives an unintelligible and clumsily lettered Xerox copy of a carbon copy of the examiner's communication. He paid at least \$65 in filing fees and probably several hundred dollars to prosecute an application, and all he gets in response to his application is a third hand copy of a short order form filled with hen scratchings and hieroglyphics. Some attorneys are also annoyed by the practice of substituting letters for proper names on the new first action forms. It is difficult to make the transition from a PO-1142 to PO-892 reference, from a PO-1142 to PO-892 reference, etc., in order to translate a 103 type of rejection. This difficulty is exacerbated by the fact that the indefinite article "A" looks like the reference "A" in the context of a rejection.

The difficulty of reading a PO-1142 is frequently compounded by ballpoint pens that skip and poor impressions made upon irregular writing surfaces. Such conditions lead to mistakes, and it is almost impossible to correct mistakes made in ballpoint in a space only one-sixth of an inch deep. Take the example of an examiner who has completely filled out his form, and then real-

izes he has made some error which requires rewriting part of his rejection. His choice is to scratch out his error and write over it, or to start another PO-1142 and do it all over again. If the rejection were made the old fashioned way the examiner, who usually writes on every other line, would merely cross out his error and write in the space between the lines.

There are two types of situations in particular where the PO-1142 is difficult to use. First, a telephone restriction requirement contains a minimum of 150 words (at five letters per average word this equals 750 letters), and frequently more. When a telephone restriction is combined with a rejection the number of characters to be squeezed into the PO-1142 increases accordingly. It is conspicuously obvious from the above that writing all this information in the meager space of a PO-1142, all the while bearing down sufficiently hard on your Ballerina ballpoint to insure an adequate impression, is no mean task. Frequently the rejection/restriction will slop over to another sheet. No matter how you look at it the PO-1142 just was not designed for this type of situation. Second, the PO-1142 just does not cut the mustard when it comes to pointing out gross informalities. For instance, what do you do when a *pro se* inventor comes into the mill and the specification is riddled with errors? Should you simply flip the applicant the old chestnut about getting "the services of an experienced patent attorney or agent", or should you point out the errors so that he may correct them himself? But where do you find room on the PO-1142? Or, what about a foreign application that does not conform to standard United States patent practice? Shouldn't the examiner point out major areas of concern? Or, what if an examiner gets a highly sophisticated case that has been floating around the Office because no one could understand it? If the case is inherently hard to understand shouldn't the examiner tell the applicant what things there are that he can't grasp? But—how can you do that adequately on a PO-1142? Again the PO-1142 fails the test of sufficiency.

On March 1972 a memorandum was sent to all patent examiners concerning the "Abbreviated First Action Program". The memo suggested that the PO-1142 will be modified at some unspecified future date to include some extra distance between lines and that an additional line per box will be added. Even though this is a step in the right direction it is still not enough. Even twice as many lines would not make the PO-1142 satisfactory for anything more than simple 102 and 103 situations. Of course, the biggest problem remains, and that is that the PO-1142 is an *inducement* to quick and sloppy work. It is an easy way to help the examiner avoid his duty of fully and adequately explaining his rejection. That is where the cancer gnaws.

The March memo also told the examiner that "when filling out the form, the examiner should keep in mind the importance of legibility, clarity, and completeness in setting forth his position." What a strange thing to say! Were it not for the administration's insistence on using the form there wouldn't be any "legibility, clarity, and completeness" problem in the first place. The examiner is not the one to blame for he is merely coping with the form as best he can. It is almost as if the administration were trying to wish away the very reasons that this form is a failure. The problem and solution are not as simple as that.

As mentioned before, the PO-1142 is adequate for most 102 rejections and some simple 103 and 112 rejections. We do not suggest doing away with the PO-1142 entirely, even though it is definitely inferior in communicative ability to a personal letter. Rather, we would like to offer up some constructive suggestions that would improve upon the PO-1142's limited utility. First, and foremost, the PO-1142 must provide considerably more writing space both in terms of line height and line length. The administration should remember that few patent examiners will ever win a prize for penmanship. Many examiners look upon the task of writing a complicated 103 rejection on a PO-1142 with as much relish as if he had been asked to inscribe the Lord's Prayer on the head of a pin. Moreover, many sages through the ages have observed that it is often more difficult to write an abbreviated message than to write a long one. The PO-1142 should include enough space so that proper names can be used. Perhaps the administration would be more sympathetic to the attorney's plight if letters were used instead of names in amendments and appeal briefs. Second, an improved system must be found that allows the examiner to correct mistakes without messing up the original and the carbon copy. Perhaps the original could be done in dark pencil and then photoduplicated.

The Journal would welcome any constructive suggestions you may have concerning PO-1142.

Exhibit G

Form 1142 Rev. 6-72		U. S. DEPARTMENT OF COMMERCE Patent Office	
PART III			<small>ORIGINAL NUMBER</small> <small>FILE NO.</small>
NOTIFICATION OF REJECTION(S) AND OR OBJECTION(S) (35 USC 132)			425
CLAIMS (1)	REASONS FOR REJECTION(S) (2)	REFERENCES * (3)	INFORMATION IDENTIFICATION AND COMMENTS (4)
1	1,3,4 35 U.S.C. 102	A	
2	2,5 35 U.S.C. 102	B/C	Axle assemblies of each fixed to tubular members (Fig 2 of B, Fig 4 of C)
3	6,7 35 U.S.C. 103	D v E + F	Obvious to extend auxiliary wheels of D (Fig 1) laterally as in E (p 2, L 1-6). Also obvious to provide vertically adjustable wheels in D as shown by F. (Fig 3).
4	6,7 35 U.S.C. 112	—	"Aperture" misdescriptive in defining a sleeve within a frame member.
5	8 35 U.S.C. 103	A v E	Obvious to extend auxiliary wheels of A (Fig 1) laterally as in E (p 2, L 1-6).
6	9-11	—	Objected to - depend from rejected claim; will be allowed if made self-contained.
7	Claim 6 would be allowed if amended to recite the specific hydraulic wheel moving arrangement.		
8	G, cited to show an analogous hydraulic wheel moving mechanism.		
* Capital letters representing references are identified on accompanying Form PD-892. The symbol "v" between letters represents - in view of - The symbol "w" or "g" between letters represents - and - A slash "/" between letters represents the alternative - or -			<small>EXAMINER</small> <small>TEL. NO.</small> (703) - 657-3141
NOTE: Sections 100, 101, 102, 103 and 112 of the patent Statute (Title 35 of the United States Code) are reproduced on the back of this sheet.			

Exhibit H

TEXT OF AN ADDRESS BY HON. ROBERT GOTTSCHALK, COMMISSIONER OF PATENTS,
U.S. DEPARTMENT OF COMMERCE, BEFORE THE PHILADELPHIA PATENT LAW
ASSOCIATION, UNION LEAGUE, PHILADELPHIA, PA. ON MARCH 9, 1972

THE PATENT OFFICE IN A CHANGING WORLD

Introduction

I am very pleased to be here this evening and to have the opportunity to share with you some of my views concerning the Patent Office and the patent system, now and in the years ahead. I thought this topic might be especially challenge in the century to our national statute, our industrial strength, our nation.

We know that the founders of this nation, with rare wisdom and foresight, provided in the Constitution for a patent system "to promote the progress of the useful arts."

We know they were right—and that our patent system has made a tremendous contribution to the development of our country—to its industry and economy, its military strength, and the dignity and well-being of all our people.

We know that we face today, at home and abroad, what may be the greatest challenge in a century to our national statute, our industrial strength, our standard of living, and our social progress.

We know that our patent system can and must play a vital role in meeting that challenge.

We know that the very heart and soul of a sound patent system lies in a sound and effective Patent Office—one which understands its mission and performs it well.

Yet, we know, too, that the office today is not as sound or effective as it can and must be to meet that challenge.

Where does this leave us?

What do we have to do?

How do we go about it?

Where do we begin?

By taking a hard look at ourselves—each of us. A long and careful look, analytical and free of bias, grounded in the experience of our history but free of its restraints and inhibitions—to see how we measure up—to see where we are falling short and to develop a sense of direction and purpose—of urgency and need—of personal commitment, responsibility, and mission.

In the Patent Office, we are doing just that. As did Janus—the ancient Roman God of all new beginnings—we are looking in more than one direction.

We are looking to our past, as an aid to understanding the present, as a key to preparing for the future.

We are looking outside ourselves, to

the public we serve, the better to serve their needs;

the nation and the world, the better to relate to the context within which we must function; and

to the fast-moving changes in technology and trade, the better to keep pace with the demands they make upon us and the new opportunities they afford.

And we are looking within, as well, to

appraise our competence and performance;

identify faults and failures; and

ready our staff, our tools, our methods, our attitudes, and our will—for the tasks at hand and those that lie ahead.

Service Operations

Most of you realize that I have not come here to tell you that the Patent Office is operating smoothly and efficiently, and that all of our problems are behind us. It was in recognition of the many problems the Patent Office faced last fall that I asked a number of leading patent law associations throughout

the country to assist the Patent Office in identifying its problems and needs.

Indeed, they did! The response from the bar was overwhelming. It was factual, and right to the point. It was enlightening, if embarrassing.

But the call to action was clear and loud. And in response, a number of special programs were initiated.

For example, we established a Customer Relations Center to assist the public in obtaining copies of patents and other documents previously ordered and not received. Many positive comments—such as, "It's the best thing that ever happened at the Patent Office"—have convinced us that the Center is successfully filling a long-felt need. At the present time, the Center is responding to between three and four hundred requests each day.

To reduce the long delays in obtaining certified copies, we established an "on-the-spot" certifying service which enables the public to obtain immediate certification of copies of file wrappers, patent applications, patents, and selected papers from patented application files. Since we began this service last October, over 2,000 requests have been filled, and the response time reduced to only a few minutes.

The problem of delay in the processing of new applications presented greater difficulties. Prompt, efficient processing of a new application is important not only from the standpoint of advising you that an application has been accepted as complete and given a serial number, but also because it creates a record for each application as it begins its journey through the office. No shortcuts can be taken; and we were forced to address ourselves to the problem of speeding up an operation that was literally tens of thousands of applications in arrears.

Our first action was to create a Parallel Application Branch to process all applications filed after October 27, 1971.

Second, we began using the regular Application Branch to eliminate the backlog.

Third, we started planning to bolster the regular branch so that—with the backlog disposed of (and it almost is)—it could resume, and maintain on a current basis, the regular processing of new applications.

Perhaps one of the most important benefits of these efforts, however, is the way they pointed up the need for better management in the Patent Office.

Professional Management

I am speaking here not only of management in general sense, but also in the terms of bringing to bear on Patent Office operations, professional administrative skills and experience.

We took a major step in this direction early in January with the hiring of Bill Merkin as our Assistant Commissioner for Administration. Mr. Merkin was formerly associated with the Census Bureau which, like the Patent Office is also part of the Department of Commerce. He brings to our clerical and administrative operations the capabilities of a professional administrator, developed over more than 20 years. We are very proud and pleased to have him as a member of our team.

He has continued earlier initiatives and instituted important new improvements in our operation. In all of this, I should mention also, we have had full cooperation and assistance from the Department of Commerce, which has in no small measure helped make these efforts successful.

During his 7 weeks with us, Bill Merkin has brought his considerable expertise to bear on—among other things—our continuing efforts to speed up the operation of our Mail Room, reduce the time it takes to mail filing receipts for new applications, and restore the printing of patents to a current schedule. Let me amplify:

Less than 6 weeks ago, for example, it took 10 to 15 days to deliver non-financial papers from the Mail Room to the Examining Groups. At the present time, these papers are arriving at the Examining Groups within 8 hours of receipt in the Mail Room. If fees are involved, the finance section requires an additional day or two.

When the Parallel Application Branch was established late last year, it took us at least 11-12 weeks to mail filing receipts for new applications. As of yesterday, the Parallel Branch was mailing filing receipts within 6 weeks. By March 31, 1972, all filing receipts will be mailed within 4 weeks.

I need not tell you that not too long ago, newly issuing patents were not available until 6 or 7 weeks after the scheduled date of issue. Our program to restore the printing of newly-issuing patents to a current basis has been given top priority. I can now announce that, as of this past Tuesday, the Patent Office has again achieved a current status with regard to the mailing of grant copies of patents. Moreover, also effective with that issue, copies of patents are also available for sale to the public on the date of issue.

People Orientation

Although I have been emphasizing our efforts to improve operations, especially those service operations which are most visible, I remain deeply concerned with the morale and motivation of the employees of the Patent Office. In point of fact, I have perhaps concentrated even more on the "people problems" than on our operations themselves because, as I have said before, morale and operating efficiency are opposite sides of the same coin.

Although we had many problems when I assumed responsibility for the Office last fall, these have probably been most critical in the "paper-handling" operations of the Patent Office.

For that reason, I began an all-out effort to bring our administrative employees back into the mainstream of Patent Office operations, and to impress upon them the importance of what they do. We are doing all we can to improve communications with these employees; to demonstrate a genuine concern for them as well as for their contributions; and to make them aware that real opportunities for training and advancement do exist. In addition, I think it fair to say that we now have in the Patent Office a more highly sensitized personnel operation which is more responsive to the needs of these employees and correspondingly more effective.

In short, we are striving to build a Patent Office team—with support and participation from every grade level, and every area of the operations of the Office—which is tightly knit, smoothly operating, and mission-oriented. And these efforts will continue—for, in my judgment, such an organization is essential to the success of our operations.

The Patent Examining Operation

These same considerations apply, with equal force, to our Patent Examining Operation. Certainly I have attempted to make the examiners aware of my conviction that this is our most basic and important activity—and one which we must perform well.

At the present, examiners are, on the average, reaching cases for first action in about 10½ months, and overall pendency of applications is only slightly in excess of 28 months. This represents—as against the situation 15 months earlier—reductions of almost 2 months in the pendency-to-first action, and 3 months in the pendency-to-issuance. So we seem to be well on the way to our goal of 18 month average pendency during FY 1975.

It might seem to some that we are shooting for two inconsistent goals: A meaningful examination and the issuance of strong patents on one hand, and on the other, the accomplishment of this process in a short period of time.

I want to emphasize, however, that in our effort to reduce pendency, we do not intend to sacrifice the development of an adequate record of all important issues, or meaningful examination, or justice and fair treatment for the applicant. On the contrary, I believe we can cut down on pendency time without adverse affect on the examination process.

This was one reason, I recently initiated a program to revive the manual classification effort. The aim is to improve the search of patent examiners, without requiring additional time, by providing them with better tools. Obviously, the more complete, up-to-date and thorough the classification of the

materials with which the examiner has to work, the better and quicker will be his search, and the stronger the issuing patent.

There are a number of other steps the Patent Office can take internally to streamline the Patent Examining Operations and speed the processing of patent applications. Several significant steps in this direction have been taken during the past year. For one thing, we developed and began utilizing the "First Action Form." This has significantly reduced the time required to prepare and mail first actions. Though perhaps not fully accepted by everyone, I think it fair to say that the form has proved successful, and that—modified in light of suggestions and comments we have received—we do intend to continue its use.

In another area, the time required for the post-examination processing of applications (which involves all operations after allowance, including the actual printing of a patent) has been reduced by almost 2 months since last July.

As these examples illustrate, such improvements will permit reduction of pendency time without entailing any sacrifice of professional effort placed on these applications by examiners.

Actions to Reduce Fraud

As most of you would quickly agree, fraud and inequitable conduct in patent prosecution is today a very live subject. Increasingly, "fraud on the Patent Office" is being alleged as a defense in litigation. Many courts are holding patents invalid or unenforceable on such grounds. This is a matter of concern to us all, and in the Office we have been giving thought to what can be done which might be helpful.

In one type of situation, the challenger contends that the patentee misled the Patent Office by failing to call attention to a prior use or prior art.

In another, but similar situation an applicant presents data or other evidence tending to support patentability, but fails to call attention to additional data which do not help his case and may run counter to it. Even if the omission is not specifically intended to deceive, the patent may be held unenforceable on the ground that the patentee's conduct was lacking in candor (as witness the recent Third Circuit decision in *Montsanto V. Rohm & Haas*).

We feel this is an area where the Patent Office, can be of help. Rule 132, as you know, provides for the submissions of affidavits to overcome rejections. We contemplate amending that rule, to require the affiant to state, in effect, that no facts, data or test results are known which are inconsistent with those in the affidavit or which would tend to give a different impression from that conveyed by the affidavit. A similar statement would also be required in cases in which the specification refers to test results.

The end result of such proposed change, we hope, will be a strengthening of the presumption of validity.

To the same general end, we are also considering some liberalization of our policy regarding examiners testifying in cases where a question of fraud before the Patent Office is an issue in litigation.

The Trademark Examining Operation

We are quite enthusiastic about the changes taking place on the trademark side of the office, but before I discuss these changes, I would like to stress one general observation: We are making progress in eliminating from Patent Office thinking the "rumble seat" attitude toward our trademark functions.

The principal vehicle which has been used to move trademarks back up to share the front seat has been the creation of a Public Advisory Committee on Trademark Affairs. Its mission has been to review the trademark problems of the office from the standpoint of the public interest, and to recommend solutions. Its Chairman is a Pennsylvanian, a good friend of long standing—Frank Foote of Mine Safety Appliances. This Committee has done a great deal of good in developing a more direct approach to the diagnosis and solution of

trademark problems in the Patent Office. We will continue on this course of modernization and improvement.

I would like to illustrate what is being done in response to the recommendations of this committee. The most recent change to be fully implemented was a reorganization in the section of the Trademark Examining Operations in which trademark applications receive initial processing. Essentially, those changes were directed to emphasize those functions which were most important from the standpoint of public needs. Without going into detail, suffice it to say, that whereas several months ago the public search file was more than 3 months behind as to data concerning newly-filed applications, this delay has now been reduced to 4 weeks. Our eventual goal is to deliver data to the Public Search Room within 10 days of the receipt of new applications.

In another important area—communication between the office and the applicant—we are introducing a number of new techniques. At present, our emphasis is on first actions and the techniques now in use, or in active stages of development, include the use of form paragraphs, transcribed by mechanically-aided typewriters; the use of check-off forms, where feasible; and the pre-addressing of the forms used in first action letters. In introducing these improvements, our goal is to increase efficiency without sacrificing substance. In order to achieve the best possible results we will, of course, need your cooperation, constructive criticism and suggestions.

There are just two examples of our current activity. The Committee made some 64 recommendations, and we have implemented, or are engaged in implementing, more than 75 percent of them. Furthermore, this Committee is continuing to advise us on matters not covered in the original report, and it will, I hope, continue to do so.

Legislation

As I am sure this Association recognizes, we remain vitally interested in sound patent revision legislation, including the Scott Amendments. And certainly we share your concern over the recent events culminating in the issuance of the Committee Print of S.643. More than ever, we are convinced that a stabilization and clarification of the licensable nature of the patent grant is as vital to the nation's economy and technological growth as it was when the Department of Commerce supported such amendments before the Senate Subcommittee on Patents, Trademarks and Copyrights last May. Moreover, we share your concern over the amendments to the Committee Print which, among other things, would require an attorney oath, would require a patentability brief without adequate protection for patent applicants, and would permit the importation into the United States of products made abroad by processes patented in this country. I can assure you that we will continue to press for a sound patent law revision, including the substance of the Scott Amendments.

International

As you know, it has been almost 2 years since the negotiation and signing of the Patent Cooperation Treaty. Since that time, we have been working with the associations such as your own, to develop the posture this country should take with regard to ratification of the Treaty. We intend to ratify the PCT and have already drafted in preliminary form the necessary legislation. And I should emphasize that our position on the Treaty is fully consistent with that expressed by the patent community.

We are quite optimistic about the advent of the PCT. We believe it will benefit the U.S. business community, and also assist our examiners to perform more thorough and complete patent searches of applications in the United States.

Equally important to the U.S. businessman is our effort to secure an acceptable Trademark Registration Treaty. This was launched by a resolution by the United States to the Executive Committee of the Paris Union in October, 1970, a system in which countries not now party to the Madrid Agreement might participate.

On May 2 of this year there will be convened in Geneva, Switzerland, a Committee of Experts to consider a revised draft of this Treaty.

This upcoming May meeting—the third of a series—is most important, since the draft treaty is now taking shape to an extent that prompt and serious examination of its provisions by interested trademark owners and associations in the United States is essential.

As you are aware, the most recent draft of the Trademark Registration Treaty was released by the World Intellectual Property Organization on January 31, 1972, and was published in the February 22nd issue of the Official Gazette. Some of the main features of the Treaty in its present form are:

1. Securing international registration, effective in designated member countries, by filing a single international application directly with WIPO.
2. Correspondingly simplified renewal, by filing a single renewal application with WIPO.
3. Notwithstanding these procedural benefits substantive matters would continue to be governed by the national law of the designated countries.

While several issues remain to be resolved, we believe that the Trademark Registration Treaty could result in significant advantages to American businessmen. We are continuing to work with a number of interested associations to obtain their comments on the draft treaty for the May Committee of Experts. The culmination of the present efforts will be a diplomatic conference scheduled to be held in Vienna, Austria, in May and June of 1973.

The Patent System and the Future

It must be clear to you that we have a broad-based concern for improving the patent system. This has its roots in the conviction that the Patent System is of vital importance, and that we will rely more, rather than less, on the incentives it affords as we move ahead into the Seventies.

In his recent State of the Union Address, President Nixon, recognized that American ingenuity has enjoyed a wide International reputation and has contributed greatly to our domestic prosperity and our international strength. He further emphasized that we should be doing more to apply our scientific and technological genius directly to domestic opportunities. In the coming year, an all out effort will be made to focus our research and development resources on projects where an extra effort is most likely to produce a breakthrough, and where the breakthrough is most likely to make a difference in our lives.

I need hardly remind this audience of the central role that the patent system has played in stimulating and making practically effective the American ingenuity of which the President spoke. In this day of competitive international challenge, it is incumbent upon us, both in Government and the private sector, to do all within our power, to strengthen the Patent System in order that it may play in fullest measure its proper role in revitalizing and strengthening the American economy. The President called upon the patent system to stimulate the application of American technological genius to the problems of the environment, and we can be sure that the President also intends that the incentives of the patent system be similarly applied to the transfer of technology from the public to the private sector which he has stressed as increasingly important.

We have learned through experience how the growth of industry and competition in this country has been fostered by the patent system. We have learned, too, how potent a force in international commerce American Trademarks can be.

We recognize that our ability to compete internationally rests in no small degree upon the strength of patent incentives in this country and the effective protection of our technology and trademarks abroad.

I pledge to you today that my efforts, and those of our entire Patent Office team, will be dedicated to doing all in our power to accomplish the President's goals through the strengthening of our patent and trademark systems.

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JUNE 30, 1972

Senator HART. I wind up the hearings having a better understanding of the patent office and the patent system. Everybody here has contributed largely to that. Thank you.

I do have a closing statement.

Tradition compels a closing statement at the end of a hearing. So, rather than reform this venerable practice, here goes.

I opened the hearings by stating that:

No system designed in 1836 can remain viable under the economic and technological conditions of 1973. And that is why the patent system is under attack. Unless it is reformed to create procedures, safeguards, and mechanisms to weed out the bad patents before issuance—whether fraudulent or not—and to assure the expeditious and impartial issuance of patents that meet the constitutional and statutory standards, the patent system will die of atrophy.

A fair reading of the hearing record, I believe, shows remarkable agreement as to the patent system's main vices. They interact and result in a game of blind man's bluff on a motorcycle, the objective seemingly being to find the edge of the cliff as quickly as possible. These vices include:

1. The ex parte manner in which patents issue.
2. The failure to disclose material information by persons dealing with the Patent Office.
3. The lack of modern search facilities and compulsory process to enable the Patent Office to obtain or compel the furnishing of such material information.
4. A tendency by Patent Office management to emphasize production goals: quantity rather than quality.
5. A lack of interest and understanding by the Patent Office of the public impact of spurious patents.
6. Submergence of Patent Office needs to the broader objectives of the Department of Commerce.

These inadequacies have interacted over the years and result in more than 70 percent of litigated patents being declared invalid. Although only one percent of the patents are litigated, those that reach the courts have a significant impact on the consuming public. For example, two invalid drug patents alone—tetracycline and ampicillin—cost consumers more than \$1 billion in overcharges. Guesstimates at the hearings indicated that a significant proportion of nonlitigated issued patents are not of sufficient inventive quality to merit a patent.

If patent reform was deemed vital in 1966, today it is imperative. Just as the President's Commission then recognized that meaningful reform could not be achieved by patchwork, a viable patent system today requires the institution of a multifaceted and interrelated approach. This includes:

1. Assuring disclosure of all material information by—

(a) Replacing the ex parte method of issuing patents with a public adversary proceeding;

(b) Requiring a patentability brief and a comprehensive oath by inventors, attorneys, and applicants;

(c) Authorizing the use of subpoenas and the discovery process; and

(d) Creating the Office of Public Counsel within the Patent Office to represent the public interest in assuring the expeditious issuance of valid patents and the prompt rejection of others.

2. Modernizing Patent Office search facilities to facilitate prompt and complete access to relevant prior art.

3. Eliminating production goals and quotas stressing quantity rather than quality.

4. Instituting a deferred examination system to allow a more thorough examination of fewer applications.

5. Instituting a system of maintenance fees to return individual inventors and small businessmen to the mainstream of technological progress.

6. Removing the Patent Office from the Department of Commerce and making it an independent agency.

The subcommittee will begin marking up a patent reform bill shortly, and it is expected that a patent reform bill will be reported before the recess. Testimony of administration witnesses indicates the existence of a progressive administration bill, and I again urge the administration to provide the subcommittee with its patent reform proposal.

As I said, I want as we adjourn these hearings to express my appreciation to the Chairman of the Subcommittee, Senator McClellan, for his willingness in authorizing the hearings and I hope that the subcommittee will find that the addition of these hearings permits us to say we have just covered the whole front.

I am grateful to Mr. Brennan for his always careful arrangement of the details and as to the management of the hearings and I thank Mr. Brennan and Mr. Nash for developing a witness list that I believe has been helpful to all of us.

I won't repeat what was said in the opening statement, namely the subcommittee's wish to get a bill to the Senate before this session closes. As we look to this calendar, this may be just another political pipe dream but it is my understanding the staff will now be going to develop basic procedures for markup. I can't resist saying at this point that if the Administration wants the attention it is entitled to, the sooner it gets it bills in, the better for all of us.

I thank again all who have testified.

[Whereupon at 1:30 pm the subcommittee recess subject to the call of the Chair.]



APPENDIX

AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.,

Washington, D.C., September 28, 1973.

Senator JOHN L. McCLELLAN,
Chairman,
Subcommittee on Patents, Trademarks
and Copyrights,
Russell Senate Office Building,
Washington, D.C.

DEAR SENATOR McCLELLAN: The Aerospace Industries Association of America, Inc., has long supported the U.S. Patent System and legislation which strengthens that system. It is with this objective in view that the attached statement of the Association on S. 1321 is offered.

Yours very truly,

KARL G. HART, JR.

Attachment.

STATEMENT TO THE SUBCOMMITTEE ON PATENTS, TRADEMARKS AND COPYRIGHTS,
COMMITTEE ON THE JUDICIARY, U.S. SENATE CONCERNING S. 1321 (HART)

The Aerospace Industries Association of America, Inc., (AIA) is the national trade association of companies in the United States engaged in the research, development and manufacturing of aerospace systems, including but not limited to manned and unmanned aircraft, missiles and astronomical vehicles, their propulsion or control units, and associated equipment.

The five topics which are the subject of the present hearings have been discussed in great detail by way of both the spoken and written word. Accordingly, AIA believes that the needs of the Subcommittee can best be served with a concise, to-the-point statement.

Public Adversary Proceeding—AIA supports such a proceeding wherein the public can present pertinent prior art to the Patent Office for a designated time after an application is deemed allowable by an Examiner. The AIA does not support, however, an inter partes opposition practice on the basis of its being time-consuming, burdensome and no more effective toward improving the overall operation of the patent system than an adversary proceeding wherein prior art is made known to the Patent Office.

Office of Public Counsel—Although AIA questions the effectiveness of the Public Counsel as proposed in S. 1321, AIA does support the position of the Department of Commerce that certain of the functions proposed for the Public Counsel would be practical and would strengthen the tools of the Patent Examiner so as to improve the examination procedure. More specifically, the AIA supports the administrative implementation of such functions as deemed appropriate by the Commissioner of Patents. The AIA does not support the establishment of an Office of Public Counsel because the Office would be costly in view of the large staff required, much of it to carry out duplicate work more appropriately assigned to the Examining Corps; it could be burdensome to patent applicants and Examiners from the standpoint that more mischief than good might be expected from a Public Counsel having such sweeping powers as are delegated in S.1321.

Deferred Examination—The AIA does not support deferred examination in the United States because there is no need for it in view of the limited Patent Office backlog. The position taken by its proponents that the quality of the resulting patent work product should be enhanced, is erroneous. There is no

assurance under a deferred examination system that the Examiner will be granted more time, for example, per patent application by his management because average time allocation per patent application is a matter which ultimately finds its way back to Congress. It was pointed out in oral testimony by a former Commissioner that during his term he had to manage the operation of the Patent Office with the resources made available to him by way of the appropriations allocated by Congress. In this connection, there is nothing to prevent a future Congress from allocating such lesser operating funds under a deferred examination system and in view of a smaller backlog, as to result in no more time per patent application as is currently available to the Examiner.

Fee Schedule and Establishment of Maintenance Fees—The AIA supports reconsideration of fees generally in keeping with previous proposals to apportion costs of examination equally between the Patent Office and the applicant; to direct the cost of supplying patent copies and other services entirely to the recipient thereof; and to have the cost of maintaining search and library facilities, the printing of patents, and the like funded entirely by the public as a public benefit function.

The AIA does not support the establishment of maintenance fees which it views as a burdensome tax in principle, and in point of fact, as specified in S. 1321, a confiscatory tax. The suggested fees are in noway commensurate with any benefit to the patent-owner or to the public. The extent the proposed fees might preclude the filing of patent applications, they would work to the public's detriment.

Administrative Restructuring of Patent Office—The AIA has not formed a position with respect to establishing the patent Office as an independent agency. The AIA supports the elevation of the Commissioner of Patents to the position of at least an Assistant Secretary. Accordingly we support the corresponding provision in S. 1957 introduced by Senator McClellan.

The AIA would like to make two additional general comments for the record. The first pertains to an inference during the hearings as to a lack of interest by industry as to the matter of general patent law revision. Industry generally, and the AIA, in particular, as evidenced by its frequent statements to the Subcommittee, is vitally concerned with having a strong patent system and one in which there is public confidence. The second is to request an opportunity to comment upon the forthcoming Administration bill referenced in the testimony of both the Department of Commerce and the Department of Justice. This request is particularly directed to any new concepts and provisions within the Administration bill that may have previously been studied and discussed in connection with general patent law revision matters before the Subcommittee.

AMERICAN BAR ASSOCIATION,
Chicago, Ill., September 26, 1973.

Re: S. 1321
Hon. JOHN L. McCLELLAN,
Senate Subcommittee on Patents,
Trademarks and Copyrights,
Washington D.C.

DEAR SENATOR McCLELLAN: On behalf of the American Bar Association, I wish to supplement the statement previously filed with the Committee.

We wish to make of record positions of the Association with respect to features of S. 1321 not previously discussed.

Obviousness.—A.B.A. approves revision of 35 USC 103 to read:

"A patent may not be obtained though the invention is not identically disclosed or described in the prior art as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and such prior art are such that the subject matter as a whole was obvious from such prior art to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made, nor because the invention has simplicity or is the last step in an evolutionary development, nor because it is not revolutionary, basic, scientific or technical in character. Claims for a new combination or assemblage of known mechanical or other elements shall be subjected to the same "standard of patentability as is applied to claims for other types of subject matter."

Further, the A.B.A. recommends the amendment of Section 103 by adding after "pertains" the phrase—at the time the invention was made—.

The Association favors imposition on parties challenging the validity of a patent, the burden of establishing obviousness with clear and convincing evidence.

Utility.—The A.B.A. approves the statutory definition of the utility requirement for patentability to include utility in agriculture, commerce, industry, health, and research.

Antitrust.—The following positions have been adopted by the A.B.A. :

(a) Disapproval of the prohibition of patent assignment and license restrictions as to selling price, geographical area, production and use, and authorizing the Section to oppose legislation for enacting any of such prohibitions. Such legislation was recommended on pages 16-18 of the report of the Temporary National Economic Committee, by a Section referendum in which 488 members opposed any such prohibition while 53 favored some degree of prohibition in one form or another.

(b) The A.B.A. approved amendment of the Sherman Act to give legislative sanction to types of limitation in patent licenses now recognized as lawful, such as limitations to quantity, type, field of use, etc. Section 35 provides that patents in antitrust cases shall be presumed to be valid unless previously declared invalid, or unless person relying on patent is on reasonable notice that patent is invalid. Section 36 denied to the Government any retroactive holding that the patent is held invalid in an antitrust case.

(c) The A.B.A. approves, legislation by which the licensable nature of patent rights should be clarified by specifically stating in the patent statute that applications for patents, patents, or any interests therein may be licensed in the whole, or in any specified part, of the field of use to which the subject matter of the claims of the patent are directly applicable, and FURTHER, that a patent owner shall not be deemed guilty of a patent misuse merely because he agreed to a contractual provision or imposed a condition on a licensee, which has (a) a direct relation to the disclosure and claims of the patent, and (b) the performance of which is reasonable under the circumstances to secure to the patent owner the full benefit of his invention and patent grant; and FURTHER, that the Section approves of legislation by which it is made clear that the "rule of reason" shall constitute the guideline for determining patent misuse.

Fees.—The A.B.A. basic position is that the Patent Office should be supported adequately to insure first class staffing, housing and equipment, that the Office should not be self-sustaining, and that fees charged should be reasonably apportioned according to the cost of providing particular services.

I has opposed granting to the Commissioner a right to fix fees.

Assignee Filing.—A.B.A. has adopted a resolution favoring this principle providing that the inventor or inventors be named in the application.

Double Patenting.—The Association favors elimination of "double patenting" as a basis for refusing issuance of a patent where expiration will occur on the same date or as a result of a terminal disclaimer provided that the right to sue for infringement is maintained in the same legal entity.

Publication.—A.B.A. has several positions.

(a) Disapproves publication of applications prior to allowance of the claims without authorization of an applicant, or after allowance without first giving applicant a reasonable time within which to elect whether or not to abandon the application, thereby preventing publication.

(b) Approves consideration by the Patent Office of patents and publications cited by the public within six months after publication of the application, provided that the applicant is given an opportunity ex parte to rebut any determination of unpatentability and also to amend the scope of any claim.

(c) Disapproves mandatory publication of applications before issue for opposition purposes.

(d) Approves a re-examination period of one year after the date of issue during which the public may cite prior art, with the opportunity given to applicants to rebut any determination of unpatentability and also to amend the scope of any claim.

Patent Court.—The Association approves the appointment of lawyers experienced in patent law as judges of a federal court of record established under

Article III of the Constitution and the utilization of such judges to sit in any Court of Appeals.

It also favors revision of Titles 28 and 35, U.S.C. to confer sole jurisdiction to review Patent Office decisions on an Article III court of record (other than a District Court).

Term of Patent.—In contrast to the 12 year proposed in S. 1321, A.B.A. favors a 20 year term running from the filing date of the application.

Prior Art (Section 102).—The Association opposes inclusion of foreign knowledge, use or sale as prior art.

Respectfully submitted,

T. L. BOWES,
Chairman, Section of Patent,
Trademark and Copyright Law.

HUNTINGTON WOODS, MICH., September 12, 1973.

HON. JOHN L. MCCLELLAN,
U.S. Senate,
Washington, D.C.

DEAR SENATOR MCCLELLAN: In the little time that has been available since I was informed that, to be given full consideration, comments on Hart S.1321 "For the general reform and revision of the Patent Laws" should be submitted by September 15, time has not been available to prepare a finished presentation on the bill. I am, therefore, limiting myself to an outline of those provisions which I think are most objectionable.

My basic objection to the bill is that I am afraid that it will be self-defeating and tend to destroy, rather than improve, the Patent System by reason of the very provisions intended to implement the commendable but impracticable objective of Sec. 1 "to assure that United States patents are of high quality and reliable."

In the light of Sec. 41(b) (1) that "Fees shall be designed to affect an overall recovery in the range of 65 to 75 per centum of the costs of operation of the Patent Office" and the following and other implementing provisions, I am afraid that such a policy would make it prohibitively expensive and complicated to obtain a United States Patent:

Sec. 3(d) would establish a Public Counsel and provide that "he shall consider and review all proceedings in the Patent Office."

Secs. 23 and 24 would authorize the Primary Examiners and the Public Counsel to issue subpoenas.

Sec. 41(c) (1) would provide that "Beginning the fourth year after a patent issues, the maintenance fee thereon shall be no less than \$1,000, and shall increase annually by at least 25 per centum each year."

Sec. 122(a) would provide for the publication of pending and abandoned applications.

Secs. 134(c), 135 and 137 would establish opposition proceedings.

Secs. 191 and 192 would provide for deferment of examination unless such examination is requested within five years of the effective filing date of the application. Such examination may be requested not only by the applicant but by any other person at the expense of the applicant except for the base examination fee. If the request is made by the Public Counsel or the United States, even this exception does not apply.

The following provisions would, in my opinion, make unreasonable or excessive demands on applicants:

Sec. 112(a) and (b) would require that the specification contain in addition to what is now required a number of new features including "all know-how known to the inventor and applicant necessary or commercially required to make, use and work the invention."

Sec. 115(a) and (a) (3) would require not only the present oath by the inventor but reaffirmation of this oath after notice of allowance and further oath that "he is aware of no prior art or other information that he . . . believes to be more pertinent than that considered by the Patent Office." This Section would also require the Attorney after notice of allowance to file a statement that he has no reason to believe the inventor not to be the original and first inventor and further statement to the same effect as the additional averment of the applicant's oath.

Sec. 131(b) would provide that "The applicant shall . . . submit (1) copies of or citations to those patents, publications or other prior art or

evidence of the state of the art which the applicant has considered in connection with such application for patent, the disclosure of which is necessary to make the application as a whole not misleading; and (2) an explanation as to why the claims in such application are patentable over such matter."

Sec. 140 would provide that "In all proceedings in the Patent Office, the applicant shall have the burden of persuading the Office that a claim is patentable."

The following Sections would, in my opinion, also confer excessive authority on the Commissioner and other Officials of the Patent Office:

Sec. 3(a) would confer upon the Commissioner the authority to "define any and all terms used in this title in connection" with proceedings before the Patent Office.

Secs. 23 and 24 would confer upon the Primary Examiner and the Public Counsel the authority to issue subpoenas.

In addition, there are several provisions which I also consider objectionable for various reasons:

Sec. 122(a) would provide for the publication of pending and abandoned applications.

Sec. 153(b) would reduce the term of patents to twelve years from the actual filing date in the United States or if priority is claimed on the basis of a corresponding foreign application from the filing date of the foreign application.

Secs. 191 and 192 would provide for deferment of examination unless such examination is requested within five years of the effective filing date of the application. Such examination may be requested not only by the applicant but by any other person at the expense of the applicant except for the base examination fee. If the request is made by the Public Counsel or the United States, even this exception does not apply.

Sec. 263 would provide that no assignment by an employee to his employer of an invention made in the course of his employment shall be valid unless the employee receives in addition to his regular salary a minimum of 2 per cent of the profit or savings made by the employer.

Sec. 4(a) of the Transitional and Supplementary Provisions provides that the Act shall apply not only to applications filed on or after its effective date but also to applications filed but not allowed before the effective date of the act.

Sincerely Yours,

A. F. BAILLIO.

THE PATENT LAW ASSOCIATION OF CHICAGO,
Chicago, Ill., September 18, 1973.

Re: S-1321
Mr. THOMAS BRENNAN,
Old Senate Office Building,
Washington, D.C.

DEAR MR. BRENNAN: It is our understanding that the Senate Subcommittee hearings on the Patent System, which commenced on September 11, 1973, were limited to five proposed legislative changes in the patent laws, and we welcome the opportunity to comment on these five proposed changes which we understand are:

1. Modification of patent examination proceedings to provide public adversary hearings;
2. the creation of the Office of Public Counsel;
3. establishment of a system for deferred examination of patent applications;
4. revision of the patent fee schedule, including the establishment of maintenance fees; and
5. administrative restructuring of the Patent Office, including the proposed establishment of the Patent Office as an independent agency.

1. Modification of Patent Examination Proceedings to Provide Public Adversary Hearings

Based upon our long experience with public adversary proceedings in Germany and Japan, our Association believes that our system would not be strengthened but would be weakened by such adversary proceedings. In

those countries we have found that many interested parties automatically file oppositions to the issuance of any patent in the particular area of their endeavor. Some few of such oppositions have merit but most of them are merely to harass and prevent the patent applicant from obtaining a patent. It is not uncommon in Germany, for example, for opposition proceedings to run the entire term of the patent. We believe such proceedings are unnecessary and undesirable in our Patent System. It is felt that the prior proposal by Senator McClellan for reexamination after issue, Section 191 of S. 643 would help improve the quality of patents without the undesirable and lengthy adversary proceedings such as exist in the German and Japanese patent laws. Note that the proposed European Patent (of which Germany will be a member) incorporates a similar arrangement for opposition or reexamination after grant.

2. The Creation of the Office of Public Counsel

Our Association approves in principle actions to improve the system of Patent Office examination and the quality of issued patents. However, it should be remembered that under our present system the Commissioner of Patents and his corps of Examiners, as well as the Board of Appeals, are in effect Public Counsel. The establishment of an office which could or would reexamine each application would not improve the system. The Public Counsel would become another tier in the examination process, and merely make it more cumbersome. The grant of subpoena power to Public Counsel to intervene in Patent Office examination procedures would unduly extensively delay the examination procedures, and greatly increase the cost to an inventor of obtaining a patent.

It is believed that the most beneficial step to improve the quality of patents would be to upgrade the quality and number of Patent Office Examiners, and to improve the techniques for searching of the prior rights.

3. Establishment of a System for Deferred Examination of Patent Applications

We are opposed to deferred examination in principle unless and until there is some viable reason for it. It would appear better to target in on a goal of examining and issuing U.S. patents within 18 months of application rather than going to a system such as is utilized in Germany, Holland, Japan and Australia. The reason for these aforementioned countries going to a deferred examination system was that they were in a hopeless situation with regard to their backlog. Such a backlog does not exist in the U.S. Patent Office.

4. Revision of the Patent Fee Schedule, Including the Establishment of Maintenance Fees

Our Association believes that the present method of setting fees for Patent Office Services, i.e., by Congress, is better than any of the proposed revisions suggested thus far. Our Association is opposed to maintenance fees.

5. Administrative Restructuring of the Patent Office, Including the Proposed Establishment of the Patent Office as an Independent Agency

Our Association supports the proposal that would establish the Patent Office as an Independent Agency.

Sincerely yours,

JAMES R. SWEENEY.

YOUNT, TAROLLI & WEINSHENKER.

ATTORNEYS AT LAW,

Cleveland, Ohio, September 25, 1973.

Re: Written Statement of the Position on Selected Portions of the Patent Reform Act of 1973 (S. 1321).

Hon. JOHN L. MCCLELLAN,
Chairman, Subcommittee on Patents,
Trademarks and Copyrights,
U.S. Senate,
Senate Office Building,
Washington, D.C.

DEAR SENATOR MCCLELLAN: This letter is written on behalf of the Board of Directors of the Cleveland Patent Law Association to advance comments concerning State Bill 1321, 93d. Congress, 1st Session. The Cleveland Patent Law Association has a membership of about 250 patent attorneys from Northeastern

Ohio who represent a cross section of patentees from individual inventors to large corporations.

Since the Subcommittee will be receiving many comments concerning the bill as a whole, the Board would like to concentrate its remarks on certain features of the bill which it believes are anti-competitive in that they favor entrenched oligopolists and which introduce excessive patent costs into the system.

Senate Bill 1321 provides for re-examination proceedings of an application before issuance. Re-examination proceedings are often used anti-competitively by those entrenched in the market place to frustrate new competitors who have made an invention and need a patent to gain a foothold in the market. This is true when the system encourages:

- (a) Delaying the issuance or enforcement of a legitimate patent by instituting re-examination proceedings.
- (b) Taking specious appeals during the re-examination proceedings.
- (c) Imposing heavy financial burdens on new competition unable to carry the burden.

Such tactics are particularly harmful to the small businessman and in areas of fast moving technology.

Re-examination before issuance of the patent is susceptible of use as an anti-competitive tool particularly if the patent term is measured from the filing date of the application. Moreover, such a system requires the compulsory publication of pending patent applications. This poses an additional financial burden on the Patent Office, whose publication costs now run approximately 40% of the budget. It also fills the Examiner's search files with many redundant disclosures increasing not only the cost of classifying and maintaining the search files, but also the time of the Examiner to make a search.

Accordingly, the Board favors re-examination only after issuance of the patent and without the right of the person instituting the re-examination to participate as a party in the proceedings. Re-examination after issuance will not make it possible to delay the patent of the legitimate patentee and will enable him to recover damages for infringement after issuance. The person instituting the re-examination proceedings should not have the right to participate as a party so that the proceedings cannot be used anti-competitively to unduly delay enforcement of the patent.

Public Counsel may be given the right to participate in the post-issuance re-examination, thus protecting the public interest. The Board opposes any Public Counsel who has the duty to select applications prior to issuance for purposes of re-examination. The task of screening applications to select those which should be re-examined would not only be a Herculean (and expensive) task but also raises constitutional law questions and delays the issuance of legitimate patents. The latter is detrimental to the public if the patent term is measured from issuance and detrimental to the legitimate patentee if it is measured from filing.

Without addressing ourselves to the desirability of modest maintenance fees, we do believe that the maintenance fees proposed by Senate Bill 1321 are excessive in magnitude, would work contrary to the purposes of the patent system, and would be particularly harmful to the small businessman. Here again the fees would become anti-competitive in an oligopolistic market.

We favor proposed bills providing voluntary defensive publication of an application by an applicant who is only interested in preserving a right to an interference.

From the foregoing you can see that we, in this letter, specifically oppose Sections 3(d), 41(c), 122, and 135 of S. 1321.

While these considerations are being advanced at this time, representatives of the Cleveland Patent Law Association would welcome further opportunity to meet with the staff and discuss in depth the above considerations and other proposals of the bill.

Also enclosed is a letter which was received from Merton H. Douthitt, Patent Counsel for SCM Corporation, Glidden-Durkee Division, and directed toward many of the points of the bill on which we as Directors of the Cleveland Patent Law Association have not taken a formal position. Mr. Douthitt is now President-Elect of the Cleveland Patent Law Association.

Very truly yours,

J. HERMAN YOUNT, JR.,
President,
Cleveland Patent Law Association.

SCM® GLIDDEN-DURKEE,
DIVISION OF SCM CORPORATION,
Cleveland, Ohio, September 21, 1973.

Re Hart bill.

Mr. J. HERMAN YOUNT, JR.,
Yount, Tarolli & Weinschenker,
Cleveland, Ohio

DEAR HERMAN: In addition to the sections you commented on, the twelve-year period for a patent monopoly measured from filing, the stiff proposed maintenance fees to arise promptly, and the employed inventor royalty section give me substantial concern.

In my personal experience, certain inventions which were looked upon as marginal but later blossomed into quite useful developments most likely never would have been filed on if short-term and/or high maintenance fees had been actualities. At least one other type of invention, a scientific breakthrough as of its time, also never would see the light of day under such proposed circumstances. A third type of invention which I have encountered from time to time is marginal because of being outside of the field in which the inventor (and often his backer) are working and familiar with. These also could be neglected and remain unpublished in the face of these proposed law features. A fourth type of invention that comes to mind, where the proposed short coverage period and prompt heavy taxation can be highly discouraging to their patenting, is an invention involving a pesticide, food material, or other substance requiring F & DA approval. Such approvals are normally quite protracted.

I have had personal experience in each one of the situations and can cite examples. My testimony is essentially as follows:

(a) The demand for isoparaffin alkylation to make 100-octane gasoline receded in the late 1940's to the extent that investment in improvement patents in this art became marginal for some years. By the late 1950's revival of this art occurred as automobile engines demanded higher octane fuels. As it actually happened, a variety of what for a time were considered marginal improvement inventions had been published. These were available for licensing, studying, teaching, and avoidance when the second flurry of activity occurred, instead of remaining proprietary and secret where they might have been neglected, re-researched, or generally unavailable.

(b) The invention represented by U.S. Patent 3,278,623 (issued October 11, 1966 on a filing of February 19, 1964) is an example of the scientific breakthrough invention type I spoke of above. It is a catalytic conversion process for changing the relatively abundant alphapinene (of restricted usefulness) into beta-pinene (a much more reactive material useful for making adhesives and many other materials). Alpha and beta-pinene are found in southeastern turpentine. Alpha-pinene, but little or no beta, is a prominent constituent of most of the rest of the world's turpentine.

A short production run on this invention about 1966 showed that the best inventive catalysts for this conversion are poisoned by even minute amounts of sulfur compounds prevalent in the feed (made from sulfate turpentine). The patent application matured reasonably rapidly into a patent (two years and eight months). At the time of filing in 1964, it was estimated that a truly economical feed desulfurization process would be available in the foreseeable future. Two further inventions later, and over nine years later, two other inventors made two further inventions which together constituted what appears to be a fairly economical feed desulfurization scheme, thus making the original breakthrough invention a component of a probably practical package. Had the inventor's corporate sponsor been faced with a mere twelve-year patent life from 1964 and/or substantial maintenance fees arising fairly promptly, this sponsor most certainly would have elected to keep the basic process secret. As it happened eventually, the sponsor elected to abandon at least one of the foreign counterparts of the basic case in view of mounting taxes.

(c) My Company has invested substantial research funds in the ultraviolet curing (drying of paints for industrial coatings), occasionally, an unexpected experimental observation of an alert research man leads to an invention possibly useful in the making of an ink, a business which the Company is not in and which is significantly different from paints and

protective coatings. A problem arises: should such an invention be filed on and patented fairly speculatively for what it may be worth, or should it be tucked away without development as merely an interesting digression from the main line of work. A short patent life and high taxes certainly would do nothing at all to stimulate the patenting and disclosure of such invention in the collateral and unfamiliar field where the Company neither operates nor had intended to investigate.

(d) Inventions made personnel of My Company in 1968 and 1969 in the pesticide field are still being field tested today. The patent applications, based on favorable screening test are subject to option agreements in case they work out well. In two to five more years from now we should know whether the optionees think they have a competitive commercial item, are willing to undertake the cost of registration of them, then will pay us 5% royalty on sales if patents are secured. Unpatented technology here will bring us very little if any revenue and then only if no unlicensed competitors appear. Most of the twelve-years of proposed patent protection will have been washed out before a sale is made.

An interesting related problem in connection with the inventions cited in (b), above, is how to award these inventors the 2% royalty of profit or savings called for in the present bill. The ultimate practicality of the breakthrough basic process, still regarded as an unusual thermodynamic anomaly, depends upon the other two inventions relating to feed desulfurizing. One of these other two is an ingenious scheme of multiple distillations to cut out sulfur bearing components cheaply and grossly, but not completely. The other takes the semi-refined product of the process and puts it into substantially finished useful condition, but itself would be too expensive if one had to operate on feed not so pretreated.

The three inventors above during this development time were paid in salary and fringe benefits at least \$750,000. Admittedly more than half of their time was on other assorted projects in this ten years. Laboratory and pilot plant facilities were supplied, along with the time and support of chemists, engineers, analysts and technicians. It is highly unlikely that such an expensive and protracted research and development program would have been started, let alone maintained, on such a speculative project had only a few years of exclusivity been available, particularly with the added reduction to possible profit represented by royalties payable to three inventors. It would be much cheaper to have some third party invent and develop such process, then license it at 6% royalty based on sales for the few years of patent life. Such royalty is fairly high in the chemicals business and is easily measured by accountants; profits and savings are far more intricate measurements; and allocation of credit for the ultimate marketability of an invention is truly a bucket of worms.

Industrial situations like this are not usual. I would foresee the net long-term effect of the proposal for specialty ascertained royalty compensation to employees who are hired to invent to be diminution in the number of such employees, their supporting facilities and supporting staff maintained. I sincerely question whether the progress of science and the useful arts is promoted rather than retarded by such a feature.

I encounter from time to time genuine disputes about inventorship or co-inventorship within a particular laboratory. I encourage laboratory personnel to talk with each other freely and get aid, assistance, and inspiration, as well as criticism, from their co-workers on various projects. Would secrecy and/or acrimony tend to develop between co-workers from a special royalty stimulation attach to the lucky winner? I think there is a substantial possibility.

All of these inventors owe some part of their success to the analytical chemists and other toilers who have devised and routinely turn out analytical results and ingenious solutions to daily tasks so that their inventors get clues initially and know where they are going subsequently. Perhaps the analyst should be compensated specially because of his lack of opportunity to make profitable inventions. I can't favor much "bootlegging" of analytical chemists' time in the direction of more glamorous projects, let alone endorse a provision which would tend to enhance it.

Sincerely,

MERTON H. DOUTHITT,
Patent Counsel.

STATEMENT ON PATENT LAW REVISION AS SET FORTH IN S. 1321 SUBMITTED BY
THE BAR ASSOCIATION OF THE DISTRICT OF COLUMBIA

I. INTRODUCTION

The Bar Association of the District of Columbia presents the following statement to the Senate Judiciary Committee, Subcommittee on Patents, Trademarks and Copyrights. This statement on Patent Law Revision as set forth in S. 1321 has been prepared by the Patent, Trademark & Copyright Law Section of the Association.

With the history of the earlier patent revision bills, the statements on S. 1321 recently made by others to the Subcommittee, and the testimony at the hearings held September 11, 12, and 14, 1973 in mind, the following comments are offered on S. 1321. It is asked that this statement be printed in the record.

There are in the Association about 370 members specializing in patent, trademark, copyright, trade secret, and in patent and trademark licensing law.

A questionnaire was circulated on the five (5) items, noticed for hearing in the Congressional Record, to each member of the Patent, Trademark & Copyright Law Section of the Association. This statement contains the votes received in response to the questionnaire, as well as general statements based on comments received in conjunction with the votes on the questionnaire and a study of statements and testimony offered the Subcommittee at the hearings.

II. GENERAL COMMENTS

There are several important points to be considered prior to addressing the specific results of the questionnaire.

A. The public should be heard on all provisions of proposed legislation

S. 1321 contains a number of provisions which are beneficial, e.g., the establishment of the Patent Office as an independent agency. It also contains provisions which are entirely new, yet have not been set for hearing or for comments by the interested public. Legislation by the Congress of the United States ought not to be adopted until the public has had opportunity to be heard on all its provisions.

It appears from testimony by representatives of the Administration at the recently concluded hearings that the Administration is readying a bill. The chairman of the hearings announced that markup will begin October 1 and that a bill is expected to be finished in the Senate this session. The proposed Administration bill has not been made available to the representatives of the public, the trade associations, or to the Bar generally.

It seems quite reasonable to afford, to those most intimately interested in the patent law, as representatives of the inventor community, the investor community, and the public at large, an opportunity to study in depth and to comment on a bill which apparently so significantly departs from earlier bills.

The Association takes the position that time is required to study and comment appropriately on the Administration bill and on the sections of S. 1321 on which no hearings have been held.

B. The patent system should be improved without drastic changes which will destroy the patent incentive

It was asserted at the hearing and in earlier entries into the Congressional Record that the examiners are convinced to allow patents by highly skilled attorneys and that this results in the allowance of increasing numbers of invalid patents. There is no evidence that the proportion of invalid patents being issued has increased.

It is not proper to scale up the meager statistics of the relatively few cases which reach the courts. The vast majority of patents are honored through licensing. Only the questionable ones are litigated and they represent a small percentage as compared to those that are honored. We don't believe such meager statistics warrant the drastic changes suggested.

In the past few years, owing to stability of the examining staff in the Patent Office, particularly due to its more effective quarters and increase in responsibility and salary of the examiners, the Patent Office has been able to retain its good examiners. These examiners, on a time basis alone, have become more familiar with the art, and in every way more capable of disposing of cases in less time. Skill in any art speeds up the artisan's ability to

produce. The Patent Office examiners are specialists and are now more competent to pass on patentability in view of the stability of the staff.

There was talk at the hearings of pressure of a disposal quota system upon the examiners. Generally, a society lives by its productivity. All enterprises to be successful must have goals. The Congress has goals for itself. Of course, such goals need to be reasonably attainable. It is human to become lax and to produce at a comparatively low rate in the absence of goals to be reached or at least striven for. There must be a measure of productivity in any system. The inquiry should be directed to the reasonableness and fairness of any quota or disposal arrangement of the system. Credit should be given to an examiner based on a balance of quality and quantity. Quality supervision in the Patent Office as in any other operation serves to hold accountable any examiner who does not do an adequate job. Our country should have the best. However, it cannot afford the luxury of an unattainable perfect system. It seems that the greatest need and possibly one going a long way toward curing the ills of the system is to make the best art better available to the examiner who then will know what it is and will be able to use his skills, as "a specialist", to apply that art properly to the proposed claims.

The few cases of asserted abuse of the patent system do not merit the very drastic changes proposed in S. 1321 which administratively will run into prohibitive costs and delays and which will derogate from the United States Patent System.

C. The users of the patent system seek valid patents

There was also testimony at the hearing to the effect that industry actually wanted a low standard of patentability so that it could obtain many patents readily. This is as far from the actual fact as a statement could be. In fact, most organizations, far from filing to obtain invalid patents, actually do not file on all the cases they believe to be patentable because of the cost involved. The lawyers acting on behalf of their principals in industry are interested in obtaining valid and enforceable patents. Litigation is costly and they are not interested in obtaining unenforceable patents which will not stand up in court.

D. Any patent law revision bill should include licensing clarification and stabilization provisions

In response to a question asked at the hearing, this Association favors including patent licensing provisions in any patent law revision bill. The licensing of patents is just as much in need of clarification and stabilization as the Patent Office operation is in need of restructuring.

III. THE QUESTIONNAIRE

The five (5) points set for hearing and on which a questionnaire was sent to members of the Patent, Trademark & Copyright Section of the Association are now discussed.

A. Greater advocacy proceedings are favored

The question submitted to the Section reads:

"Are you in favor of greater advocacy proceedings in the U.S. Patent Office with the opportunity of the public to participate in the examination?"

The Section members were in favor of greater advocacy proceedings including public participation in the process. The approval of the question is an *in principle* approval and not necessarily approval of any particular provision of S. 1321.

Although "greater advocacy" is favored, many feel that the public should not take any part in the prosecution of applications prior to allowance of the application or prior to the allowance of at least some claims by the Patent Office.

Those in favor believe that validity would be improved if better art were before the examiner. This would strengthen the system, increase the confidence of the judiciary in patents, and give a better image to patents. It is recognized that increased costs, greater delays, discouragement of filing of patent applications, complication of matters in the Patent Office, and harassment of applicants could also result. Some of these detriments might be unavoidable with new advocacy proceedings. However, proper safeguards should be taken to minimize such detriments.

B. Public counsel in the patent office is not favored

The second question referred to the membership reads:

"Are you in favor of a public counsel participating in an examination proceeding?"

There was a strong disfavor voiced to the establishment of a public counsel as provided in S. 1321.

Apparently public counsel is sought to be provided by S. 1321 simply because of the allegation that "hordes" of invalid patents are being currently issued. There is no basis for such an allegation.

The establishment of public counsel as provided in S. 1321 would not help get the best art before the examiner, but rather will cause delays and will be costly, establishing more bureaucracy and expenses which will freeze out the smaller or independent inventors and businesses.

The examiner is a "specialist" in a much better position to evaluate pertinent prior art than a generalist from any public counsel office.

Importantly, unless each application is reviewed by public counsel in an identical manner and to the same extent, it will be argued that a given patent is not entitled to a high presumption of validity because the patent wasn't examined by the public counsel. Obviously public counsel could not review every application.

The Department of Justice spokesman stated at the hearing that Court decisions strongly suggests that the "primary goal" of patent reform should be to get as much information as possible before the Patent Office from all sources—the applicant himself, the office search files, and members of the public. A public counsel will not help achieve this goal.

C. Deferred examination is favored

The question put to the Section reads:

"Are you in favor of deferred examination before expiration of five (5) years from the filing date?"

This question was answered affirmatively by a majority. Reasons given in support were it would: (1) save applicants money; (2) reduce the Patent Office workload; and (3) give an applicant more time to evaluate his invention prior to spending money for examination.

Also noted in many answers was the problem that there would be a long period of uncertainty during which the public would not know the scope which would ultimately be accorded the published application.

D. Maintenance fees are not favored

The question put to the Section reads:

"Are you in favor of maintenance fees?"

There was a strong objection to maintenance fees in general. The extent of the fees provided for in the S. 1321 provision is considered prohibitive and confiscatory. Further, this provision would create a tremendous administrative burden for the Patent Office in deciding the myriad of petitions for pauper's or special treatment. At the same time the public would be uncertain as to the status of many patents.

The cost of developing and commercializing inventions is already a great enough burden to impose upon the inventing, developing and investing community. If over a period of many years one develops a sizable number of patents directed to the area of his invention, considerable costs could result from maintenance fees which could seriously inhibit further commercialization efforts. It seems more logical that such monies be utilized by the private enterprise system to further its efforts to commercialize the invention.

Often the only basis an inventor has to obtain funding for the development of his invention is his unexpired patents. If the patents lapse for want of maintenance fees, there will be no financing and important developments will be lost.

E. Establishing the patent office as an independent agency is favored

The question submitted reads:

"Are you in favor of the Patent Office being an independent agency?"

The Section members voted in favor of establishing an independent Patent Office. Reasons given were (1) that Patent Office policy should be established by people experienced in the patent field, (2) there would be more independence of thought and action, (3) there would be more effective administration

of the system, (4) the Commissioner would have stronger control, and (5) there would be greater prestige for all Patent Office employees which would raise the quality level of examination.

Many of those who were opposed to the question, favored elevating the Commissioner to the secretaryship level in the Commerce Department. Certainly, the Association would approve elevating the position of Commissioner of Patents to that of assistant Secretary reporting directly to the Secretary of Commerce.

Either of the above changes would help attract to all levels of the Patent Office the best possible talent and help to retain the very good talent that is there now. Obviously, status is an important item to most people. Upgrading the Patent Office from top to bottom would no doubt be salutary.

IV. CONCLUSION

The Association would like to note that there are numerous other provisions in S. 1321 which are new and significant. Accordingly, it is hoped that Congress will give the public an opportunity to comment on these other provisions if consideration is being given to their adoption.

The Bar Association of the District of Columbia thanks the Subcommittee for the opportunity to submit this statement.

AUSTIN F. CANFIELD, JR.,
President.

STATEMENT OF ELECTRONIC INDUSTRIES ASSOCIATION

The Electronic Industries Association is the National Trade Association representing U.S. electronics manufacturers. We appreciate this opportunity to comment on the subject of patent reform legislation.

The electronic industries of the United States have an annual sales volume of nearly \$30 billion and employ well over one million people. Members of our Association range from manufacturers of the smallest electronic part to corporations that design and produce the most complex systems used in industry, defense and space.

The Electronic Industries Association endorses a broad evaluation of the patent system and constructive efforts to improve the system. In this connection, we note that two major areas appear to be covered in the legislation and serve as the background for these hearings. One of these is the development of concepts which would attain greater certainty with respect to patent validity. The other appears to have its basis in the question of the backlog of patent applications within the Patent Office. It is our view that there is no insurmountable problem with respect to this backlog and therefore feel that specific provisions in the legislation that deal with this topic are for the most part unnecessary. This statement is therefore primarily directed towards the question of improving patent validity.

By way of further introduction, we wish to make it clear that we are strongly opposed to "change for the sake of change". It is believed that various provisions of the proposed legislation, e.g., Sections 112, 263 and 153(b), radically change well established precedents, create uncertainty where certainty now exists, and impose a burden on the applicant of such magnitude that the task might not be worth the reward. The underlying rationale of these sections is apparently premised on the philosophy that the patent applicant is receiving something for nothing. Let it not be forgotten that the Constitutional purpose of the patent laws is to reward the inventor for his disclosure to the public.

Following are specific comments with relation to the five items listed in the announcement of these hearings:

ADVERSARY PROCEEDINGS

This Association agrees with the general premise that there should be a greater opportunity for the public to participate in the patent process. We specifically favor the concept of such public involvement as a positive step towards increasing the quality of issued patents. However, we are concerned that any legislative mandate for proceedings of an adversary nature between

an applicant and the public at large could frustrate the very purpose of the patent system by encouraging the suppression of new technology rather than its early disclosure.

The cost of obtaining a patent already exceeds the financial means of many prospective applicants. Any proposal which would further increase these costs by providing for additional inter partes proceedings within the Patent Office, and attendant appeals could effectively result in the extinction of the patent system for all but the affluent applicant. Accordingly, while we agree that the public should be given an opportunity to provide the Patent Office with pertinent references and other facts relevant to patentability, we urge that such rights be subject to appropriate safeguards, both with respect to time and participation, so as not to unduly impede "... the progress of science and useful arts". We believe that the Patent Office, given the proper legislative authority, is best qualified to establish such safeguards.

In this regard, we call your attention to the Notice of Proposed Rulemaking regarding "Protests to the Grant of a Patent" dated May 15, 1973 and published in the FEDERAL REGISTER on June 4, 1973. We feel that the enactment and evaluation of regulations of this nature are necessary first steps in the direction of public participation. The experience which will then be gained will enable the Patent Office to determine the degree to which public participation can be effectively integrated into the existing patent system.

Accordingly, we suggest that the legislative intent with respect to the proposed Bill be revised to invest the Commissioner of Patents with discretionary authority to promulgate guidelines for public participation, based upon Patent Office experience and capability.

PUBLIC COUNSEL

EIA is opposed to the concept of a Public Counsel in the sense of a new independent office or public adversary.

We are similarly opposed to any government participation in the patent process other than participation by the Patent Office—the agency that is charged by statute with the control and issuance of patents.

We submit that the creation of a whole new entity or group to do battle with the Patent Office, on behalf of the public, would result in great expense and delay in the patent process and thus would be counter-productive to the favorable benefits of "public participation". We believe that the Patent Office, given the proper legislative authority, has the expertise necessary to properly implement a full and democratic concept of public participation.

DEFERRED EXAMINATION

The EIA sees no present need for the institution of a system of deferred examination. The needs and conditions within European countries where such a system is in force are not present in the United States. We submit further that the institution of a system of deferred examination would be contrary to efforts to achieve early certainty with respect to the scope of patents.

Following are some of our specific concerns with reference to deferred examination:

It appears to us that the manner in which this country, and more specifically the Patent Office, are progressing in the handling of patent applications, and the decrease in the applications' backlog in this country, seem to mitigate much of this basis for deferred examination.

Each company or interested party would be forced to devote a disproportionate amount of time, energy and money for the constant and continuing examination of all of its many competitors' applications and claims. This burden we might point out falls with even greater impact on smaller companies and individual inventors.

We submit that achievement of certainty as to patent validity can be more readily achieved under some form of constructive public proceeding.

Extended time for amending claims, permitted under deferred examination, permits tailoring of claims to cover a competitor's product where the original tenor of the claims may have been directed to entirely different subject matter.

MAINTENANCE FEES

This Association certainly appreciates that a concept of reasonable maintenance fees is one intended to keep initial costs down—and this encourages greater entry into the patent process by small companies and individual inventors. We subscribe to any constructive steps that can be taken to insure the widest practicable access to the patent process.

However, we believe that the total costs involved in the patent process must be maintained at reasonable levels. Obviously, the sum of the fees directly attributable to obtaining a patent should not exceed a reasonable proportion of the costs of the Patent Office.

In addition, we are specifically opposed to the schedule of maintenance fees described in S. 1321 as being unreasonably high and bearing no foreseeable relationship to the costs of the Patent Office.

The charging of inordinate fees can result in subverting the patent process. As the costs of maintaining a patent grow to such a magnitude, the net result is that parties find it more economical to copy rather than innovate or develop new products.

INDEPENDENT AGENCY

EIA is in favor of any constructive efforts which would truly result in improving the patent process for all. For instance, we object to the current vulnerability of the Patent Office budget within that of the Commerce Department which does not provide for sufficient protection against use of funds for purposes unrelated to the patent system.

In any event, it is clear that basic to any reform of the patent system is a necessity for upgrading the status, prestige, and even visibility of the Patent Office—wherever it be located.

In this context, we submit that creation of the Patent Office as an independent agency would be a positive step to achieving these general basic aims. When we say this, however, it must be made clear that the agency must be structured so as to not merely expand the bureaucracy. It must be in a position to view patents as a business tool and be able to withstand any outside pressures which could ultimately subvert its purposes.

U.S. SENATE,
COMMITTEE ON THE JUDICIARY,
SUBCOMMITTEE ON ANTITRUST AND MONOPOLY,
Washington, D.C., November 15, 1972.

MR. HOWARD I. FORMAN,
*Patent Department,
Rohm and Haas Co.,
Philadelphia, Pa.*

DEAR MR. FORMAN: Thank you for sending me a copy of your recent delivery entitled, "*Patents/Antitrust Ecology vs. National Prosperity*." Although I cannot agree with everything stated, I found your paper interesting and appreciate receiving all diverse views on this important subject.

Sincerely,

PHILIP A. HART, *Chairman.*

ROHM AND HAAS CO.,
Philadelphia, Pa., October 25, 1972.

To:

PRESIDENT RICHARD M. NIXON,
DR. EDWARD E. DAVID, JR., White House Science Advisor,
HON. PETER G. PETERSON, Secretary of Commerce,
HON. RICHARD O. SIMPSON, Acting Assistant Secretary for Science and Technology,
HON. ROBERT W. CAIRNS, Deputy Assistant Secretary for Science and Technology,
HON. ROBERT GOTTSCHALK, Commissioner of Patents,
HON. RICHARD G. KLEINDIENST, Attorney General,
HON. THOMAS E. KAUPER, Assistant Attorney General—Antitrust,
HON. JOHN L. MCCLELLAN, Chairman, Senate Patents Subcommittee,
HON. QUENTIN N. BURDICK, Member, Senate Patents Subcommittee,

Hon. HIRAM L. FONG, Member, Senate Patents Subcommittee,
 Hon. HUGH SCOTT, Member, Senate Patents Subcommittee,
 Hon. PHILIP A. HART, Member, Senate Patents Subcommittee,
 THOMAS C. BRENNAN, Esq., Counsel, Senate Patents Subcommittee.

GENTLEMEN: Attached hereto, for each of you, is a copy of a paper I will be delivering on October 26, 1972, entitled "PATENTS/ANTITRUST ECOLOGY vs. NATIONAL PROSPERITY". In this paper I have proposed actions to be taken by the Executive and Legislative Branches in order to overcome the apparent impasse confronting those who advocate the vastly divergent views regarding the proper application of our patent and antitrust laws. The actions proposed are fully within the recommendations made in President Nixon's message to the Congress on March 16, 1972 regarding the importance to the nation of research and development, science and technology. I respectfully urge your consideration of these proposals as being of potentially great importance to the nation.

Sincerely,

HOWARD I. FORMAN.

PATENT/ANTITRUST ECOLOGY vs. NATIONAL PROSPERITY *

(By Howard I. Forman)

(ED. NOTE: In a speech before The Philadelphia Patent Law Association on November 30, 1972 entitled "Patents and Antitrust: How Clear is the Water", the Hon. Bruce B. Wilson, Deputy Assistant Attorney General, Antitrust Division, referred to the following paper by Mr. Forman and particularly one of the latter's proposals "to make patents more reliable and to make the patent system the incentive it was designed to be in furthering this country's technological progress," which he declared merited serious consideration. Referring to Forman's proposal for an incontestable patent, Mr. Wilson stated:

Certainly we would be taking a risk to adopt such a provision. The risk would be that an invalid patent might become incontestable. But the risk might, perhaps, be worth taking, and the idea deserves further consideration. Certainly, incontestable patents would contribute toward the resolution of the concern expressed by the Chief Justice and a unanimous Supreme Court over the effect of patent litigation upon a heavily burdened judicial system. As you all know, patent cases tend to be complicated and long-drawn out litigation, weighing heavily upon judicial time. Perhaps more important, however, incontestable patents would place their owners in a secure position so that large investments could be made leading to commercialization of their inventions. Research and development, in and of itself, is a fine thing, but unless the product of that research and development reaches the marketplace, the ultimate consumer is no better off than if no research or development had taken place.)

The invitation which I received to address you today was accompanied with the suggestion that I might elaborate upon a subject I discussed at a meeting of the National Industrial Conference Board about 18 months ago. That subject was the "Scott Amendments" to the current Patent Law Revision Bill.¹

The paper I presented then bore the title "Changing Characteristics of Private Property". Since it has appeared in four publications² of wide circulation I won't repeat any of its detailed points at this time. It should suffice to say that its theme consisted of analogies drawn between the well-established, universally accepted legal rights to one's real property and what we normally consider to be personal property, on the one hand, and rights to one's intellectual property (e.g. patented inventions) on the other hand.

The conclusions reached, which I will re-state in a somewhat over-simplified manner, were that acts involving the use of personal and real property, that have never previously been considered to be improper, unexplainedly and illogi-

* Presented before the Licensing Executives Society, Annual Meeting, Oct. 26, 1972, San Antonio, Texas.

Also published in "Les Nouvelles", the Journal of the Licensing Executives Society, December, 1972.

¹ S. 643 (92nd Cong., 1st Sess., 1971).

² Forman, "Changing characteristics of Private Property", Record of Hearings Before Subcommittee on Patents, Trademarks, and Copyrights, U. S. Senate, on S. 643, S. 1253, and S. 1255, Part 2, p. 633 (May 13, 1971); 53 J. Pat. Off. Socy 530 (August 1971); S. The Conference Board RECORD 41 (October 1971); 2 Patent Trends No. 3 (March 1972).

cally have been made by some law enforcement authorities to take on the specter of illegality when they involve the use of intellectual property. Pointing to the foolhardiness of such a situation, and the detriment it has caused in interfering with the progress of the arts and sciences which the Constitution calls for in providing for our patent system, I urged adoption of the Scott Amendments to rectify this condition.

It is interesting to note that since the time I gave that speech the U.S. Supreme Court, in a decision³ involving a garnishment of a working mother's savings account, has spoken out strongly in favor of private property rights even in the face of an attack based upon human or civil rights. Said the Court, "the dichotomy between personal liberties and property rights is a false one. Property does not have rights. People have rights. The right to enjoy property without unlawful deprivation, no less than the right to speak or the right to travel, is in truth a 'personal right' whether the 'property' in question be a welfare check, a home or a savings account. In fact, a fundamental interdependence exists between the personal right to liberty and the personal right in property. Neither could have meaning without the other. That rights in property are basic civil rights has long been recognized. * * * Congress recognized these rights in 1871 * * *. We do no more than reaffirm the judgment of Congress today."⁴

Editorializing on this case, the Wall Street Journal⁵ noted that the Court's rejection as false any distinction between property and human or civil rights "put private property where it belongs—in the broad context of civil rights and individual liberties, not as a thing apart." It is encouraging to note that the Court, even in the midst of current heated public arguments over civil rights and socio-economic reform, adheres to the principal that property rights are equal to such other liberal rights as freedom of speech, press and assembly. Perhaps, then, when the Court considers matters involving intellectual property rights it will give them the same recognition and the same treatment, by keeping in mind that intellectual property is but another form of private property.

I will have more to say on the subject of the Scott Amendments and private property rights later. In actuality, it is only one phase of a much broader subject, a problem of tremendous importance to our national welfare. I refer to the much too old conflict between those who administer our patent system and those who enforce our antitrust laws. In this conflict we have a strange dichotomy of two governmental groups, each bent upon fostering programs aimed at achieving identical goals of improvement to the nation's economic prosperity, and yet each claiming that the other is causing mayhem to our economy and thereby to our nation's economic welfare.

A pity it is that this conflict has led to tremendous wastes in precious manpower, time, financial and other national resources, first in the patenting process and then in the courts. These wastes are even further much aggravated by the fortunes spent uselessly in research and development programs, the construction of plants and the implementation of marketing projects, all of which may go down the drain as the aftermath of judicial decrees holding patents invalid or a business agreement involving patents illegal under some novel antitrust theories. These wastes are polluting our economic atmosphere, and the matter is as deserving of ecological consideration and treatment as much as or more than any other pollutant that has been deemed harmful to man.

Ecology, I need hardly remind you, is the "in" thing of the 1970's. A Congressional committee has labelled this period as "The Environmental Decade", and President Nixon has called attention to the preciousness but vulnerability of our natural resources which caused a need to develop new attitudes and new management techniques in order to preserve a good environment.⁶ The House committee pointed out that a major problem is that many federal agencies are involved in programs for managing the environment which work at cross-purposes, and called for better coordination of those agency activities.⁷

An example of a need for better coordination familiar to most of you may be found in the governmental edicts affecting the manufacture and sale of

³ *Lynch v. Household Finance Corp.*, 40 LW 4335 (March 21, 1972).

⁴ *Id.* at 4339.

⁵ "Supreme Court and Private Property", WSJ April 3, 1972.

⁶ House Report No. 91-1082 (91st Cong., 2d Sess.) 1970, by the Committee on Government Operations, p. 2.

⁷ *Id.* at pp. 15-16.

household laundry products. One of the first orders of the day was a ban on phosphates in such products because they were found to pollute our streams and lakes, adversely affecting the life cycles of plants and fish in those waters. The cleansing agents substituted for phosphates not only made the housewife unhappy because of difficulty in removing the dirty ring from her husband's shirt collars, but much more important were found to cause serious medical problems in man. These problems became so serious that the federal health authorities stepped into the picture to countermand the phosphate ban.

There's an important lesson to be learned in this example, and it has direct applicability to problems involved with the lack of coordination in the enforcement of our patent and antitrust laws. As background information for the point I am making let me refer you to another ecological study, "Environmental Pollution—A Challenge to Science and Technology", a report⁸ of the House Subcommittee on Science, Research and Development. This study also calls for coordination by the various federal agencies involved with pollution abatement—proposing the establishment of a "system management" to deal with the problem. It holds that a key to the whole affair is cost analysis, suggesting that: "Social sciences will be called upon to replace subjective evaluation with numbers of dollars. * * * The costs of abatement must be equated with quality."⁹

The report contains a graphic illustration which the Department of Defense presented at Hearings held by the Subcommittee in 1966 on "The Adequacy of Technology for Pollution Abatement". Referring to that illustration, the Committee states: "... if costs are known, a portion of abatement can be written off against damages * * *. Control beyond that point is a net debit to the Nation. * * * The point of view that insists on complete prevention of waste disposal to the environment is shown by this analysis to lead to very high costs which may exceed the gains to society * * *"¹⁰

In our economic environment there likewise are great wastes, as I pointed out previously. For our great nation, which now finds itself in a truly growing competitive struggle to maintain its economic leadership internationally, there is need as never before to abate those wastes. We can no longer afford the luxury of permitting different federal agencies free and independent rein in their actions which bear upon the progress of our national economy, particularly if those actions become involved in collision courses. Just as strong, determinative and well-coordinated action must be and is now being taken by various governmental agencies to improve our atmospheric and biological environment, it is likewise imperative that equally strong, determinative and well-coordinated action be taken to improve our economic environment. The key word in both instances is "*well-coordinated*".

On March 16, 1972 President Nixon sent a message¹¹ to the Congress which his Science Adviser, Dr. Edward E. David, Jr., described in a press conference that day as "the first message by a President to the Congress on research and development or science and technology". Certain of the President's statements in that message are of crucial import and interest to everyone concerned with our nation's economic welfare and I shall quote them directly:

The importance of technological innovation has become dramatically evident in the past few years. For one thing, we have come to recognize that such innovation is essential to improving our economic productivity—to producing more and better goods and services at lower costs. And improved productivity, in turn, is essential if we are to achieve a full and durable prosperity—without inflation and without war. By fostering greater productivity, technological innovation can help us to expand our markets at home and abroad * * *.

* * * * *

"We know, for instance, that a strong and reliable patent system is important to technological progress and industrial strength. The process of applying technology to achieve our national goals calls for a tremendous investment of money, energy and talent by our private enterprise system.

⁸ A Committee Print of the Committee on Science and Astronautics (89th Cong., 2d Sess., 1966).

⁹ *Id.* at p. 34.

¹⁰ *Ibid.*

¹¹ From release by Office of the White House Secretary, March 16, 1972.

If we expect industry to support this investment, we must make the most effective use of the incentives which are provided by our patent system.

"The way we apply our antitrust laws can also do much to shape research and development. Uncertain reward and high risks can be significant barriers to progress when a firm is small in relation to the scale of effort required for successful projects. In such cases, formal or informal combinations of firms provide one means for hurdling these barriers * * *. In general, combinations which lead to an approved allocation of the resources of the nation are normally permissible, but actions which lead to excessive market power for any single group are not. * * *

President Nixon has aptly stated truisms that have been known for years to people involved in business built upon the fruits of research and development, people involved in inventions, in patents, in the licensing of patents and know-how. He has stressed the need for more technological innovations, underscored the importance of the patent system in fulfilling that need, and reminded us that the antitrust laws are necessary to protect us against those who abuse the opportunities provided by the nation's investments in research and development and fostered by federal grants of patents on the fruits of those investments. Still needed, however, is the coordination necessary to prevent the administration of, and operation under, our patent laws from resulting in a collision course with the enforcement of our antitrust laws. Apparently recognizing this, the President went on to say:

I believe we need to be better informed about the full consequences of all such policies for scientific and technological progress. For this reason, I have included in my budget for the coming fiscal year a program whereby the National Science Foundation would support assessments and studies focused specifically on barriers to technological innovation and on the consequences of adopting alternative Federal policies which would reduce or eliminate these barriers. These studies would be undertaken in close consultation with the Executive Office of the President, the Department of Commerce and other concerned departments and agencies, so that the results can be most expeditiously considered as further Government decisions are made.

Hopefully, such studies will result in unifying, coordinative actions within the Executive Branch so as to eliminate the competition and overt opposition between some of its component departments and agencies in areas where there should be a single national policy and a single approach to administering that policy. A classic example of a need for unitary action within the Executive Branch—a need which went begging, most unfortunately—took place last May when the Senate Patents Subcommittee held hearings on the Scott Amendments. As Mr. James T. Lynn, Under Secretary of Commerce, testified:

The views I express here this afternoon are those of the Department of Commerce. The Department of Justice has certain reservations about the positions we have taken and will express its own views on the subject. To which the Subcommittee Chairman, Senator McClellan replied:

I think we can state unequivocally, then, that the Government as such or the Administration as such does not have a policy with respect to this legislation; there is a divided opinion in the administration as to the merits of those amendments?

Responded Mr. Lynn:

That is right, Mr. Chairman. The administration has decided that the best contribution it can make to the resolution of these important legislative issues is to share with this committee its analysis of the problems and the points of views which express both the interests of patent holders and general objectives. The latter will be provided by the Justice Department witnesses.

The Department of Justice did, in fact, present its own views, through the testimony of its Assistant Attorney General, Antitrust Division, Richard W. McLaren.

In failing to present a unitary position of the administration, the proverbial "buck" was passed to Congress. I submit this was a tactical error, a missed opportunity the Executive Branch had in its grasp to perform the complete job that President Nixon now proposes to do hereafter, namely to focus attention "on barriers to technological innovation and on the consequences of adopting alternative federal policies which would reduce or eliminate these barriers."

Without unitary leadership of the Executive Branch the Senate Patents Subcommittee, by a 3 to 2 vote, rejected the Scott Amendments last October. Senator Fong, who voted with the majority, has been understood to declare that if he could be satisfied that those Amendments would not in any way adversely affect the operation of the antitrust laws represented by the Sherman and Clayton Acts and their judicial interpretations, he might change his vote. Satisfying Senator Fong on this point should hardly be an insurmountable obstacle, for the proponents of the Scott Amendments (both those who favored them in their original form and those who favor the modified form advocated by the Department of Commerce) have repeatedly declared that they do not advocate any language or interpretation of legislative terminology which would dilute or negate the antitrust laws. It would have been logical for the Justice Department's antitrust specialists to get together with the Commerce Department's patent specialists and work out the legislative formula to achieve Senator Fong's requirements. Since this has not been done, one group of lawyers experienced in patent and antitrust matters has attempted to resolve the impasse by preparing a suggested "Legislative History"¹² which, in their view,

"This 'Legislative History', it may be observed somewhat curiously was prepared by an assemblage which dubbed itself the 'Tuesday III' group. This name resulted from the fact that by sheer chance the group actually met on a Tuesday. The 'III' was to differentiate it from the 'Tuesday I and II' groups, consisting of other members, who were reputed as having authored the original Scott Amendments. The 'History' is as follows:

"By recommending sections 261 (b), 271 (f) and 271 (g), the Subcommittee does not intend to modify the effect of the antitrust laws as heretofore interpreted by the Courts except as follows:

"1. Section 271 (f) (2) (a) removes the authority for a patent license agreement to require a licensee to maintain a certain price in the sale of licensed products as expressed in *U. S. v. General Electric Company*, 272 U.S. 476 (1926).

"2. Section 271 (g) (1) (a) refers to the right of a licensor and licensee to negotiate a royalty of any amount they agree upon in the tradition of our bargaining system as recognized in *Brulotte v. Thys Co.*, 379 U.S. 29 (1964). Any authoritative effect to the contrary in the 7th Circuit decision in *American Photocopy v. Rovico*, 359 F.2d 745 (1966) (referring to "exorbitant and oppressive" royalties) would be removed.

"3. Section 271 (g) (1) (c) makes it clear that a package transfer or license arrangement which does not segregate the charge for each included patent will not (in the absence of other circumstances, such as coercion) constitute misuse or an illegal extension of the patent monopoly. To the extent that this provision would sanction a package license which does not provide for a diminution in the royalty upon the expiration of a patent included in the package, it would appear to be inconsistent with the position taken by the majority of the court in *Rocform Corporation v. Acitelli Standard Concrete Wall, Inc.*, 367 F.2d 67 (1966). However, it would be consistent with the view expressed in more cases, such as in *Well Surveys, Inc., v. Perfo-Log*, 396 F.2d 15 (1968).

"4. Section 271 (g) (1) (d) provides that a mere difference in royalty rates between different licenses, without more, would not constitute misuse or illegal extension of patent rights. It therefore accords with the view expressed by the 7th Circuit in *Bela Seating Co., Inc., v. Polaron Products, Inc.*, 16 USPQ 548 (1971). Any authority to the contrary in *LaPeyre v. F. T. Co.*, 366 F.2d 117 (5th Cir. 1966) and *Peelers v. Wendt*, 260 F. Supp. 193 (W.D. Wash. 1966) would be removed. Those cases apparently condemned a lease rate for patented shrimp peeling machines based on the savings from use of the machines over hand peeling, because the peeling industry in the Northwest derived more savings, and therefore paid more than the Gulf Coast peelers. The difference in royalty rates, being based on the value of the invention to the different users, seems wholly within the patent grant and therefore not properly condemned under the antitrust laws. But 271 (g) (1) (d) would not legitimize royalty rates when used primarily for the purposes of anticompetitive discriminating between licensees.

"Since the decision of the Supreme Court in *Lear v. Adkins*, 395 U.S. 653 (1969), numerous lower court decisions have relied upon the public interest to set aside settlement agreements, consent judgments, and arbitration decisions where a party subsequently attacks the validity of a patent. Continuance of that trend will drastically reduce the number of settlements by agreement and/or arbitration and correspondingly increase court time devoted to litigation. Since such settlements, like decisions on the merits after a full trial, are binding only upon the parties involved, this Subcommittee believes the added burden on the courts and the unnecessary expense to the parties should be avoided. The Supreme Court has recently had occasion to point out the relatively large amount of expensive trial time taken by patent litigation, as compared with other civil cases. *Blander-Tongue Laboratories v. University of Illinois Foundation*, 28 L.Ed.2d 788 (1971). Accordingly, section 271 (h) is intended to over-rule such decisions as *Business Forms Finishing Service Inc., v. Carson*, 452 F.2d 70 (7th Cir. 1971). Section 271 (h) has been retained in modified form to permit settlement of litigation where there has been a settlement with approval of a court or by a bona fide independent arbitrator without collusion.

"By including the word 'solely' in sections 271 (f) (1) and 271 (g), the Subcommittee intends that each course of conduct referred to in those sections be considered separately, and the provisions of those sections need not apply when an agreement or arrangement combines one authorized course of conduct with another authorized course of conduct, or with other conditions, limitations or restrictions which result in misuse or illegal extension of patent rights. For instance, section 271 (g) (1) (c) provides that mere package licensing of several patents is legal but would not legitimize coercive package licensing, as condemned in *American Security v. Shatterproof Glass Corp.*, 268 F.2d 769 (3rd Cir. 1959)."

would effectively prevent the Scott Amendments, if enacted into law, from ever being capable of acting as a defense to an action based upon our conventional antitrust laws. I submit that if this approach is adopted, when the new Patent Law Revision Bill and the revised Scott Amendments are introduced in the next session of Congress, it should satisfy not only Senator Fong but also the opponents to the Amendments in the Justice Department's Antitrust Division. Of course, a little help or support by the Executive Branch at that time would help, and I look for the White House to do so by asserting the leadership and coordinative effort that President Nixon espoused in his speech which I've quoted from previously.

One might ask why should the Scott Amendments be adopted? Why should the conflicting policies of the Commerce and Justice Departments be resolved in favor of a single policy aimed at maximizing the benefits inherent in both the patent and antitrust laws? There are undoubtedly several very good reasons, but my answer to both questions could be summed up in one word: UTILIZATION! Yes, utilization. Utilization of our limited national resources. Utilization of our limited national assets. Utilization of the products of man's genius, man's brainpower, man's ability to invent, to conceive of new and better ways of improving our way of life, of new and better things that aid in our nation's health and welfare, that aid in our nation's prosperity. All of these products are finite assets and their utilization must be promoted and guarded, for if they are lost or left unused they will be wasted. The licensing provisions of the Scott Amendments will foster utilization of patented inventions to a greater degree than ever before. The Commerce and Justice Departments should not stand leagues apart to debate the point with each concerned only with its own narrow perspectives. The administration charged with the responsibility of all phases of government operation should wring from both a single position which it deems will best utilize the patented inventions which are or could be involved.

President Nixon, in his speech from which I have quoted, further stated "*an asset unused is an asset wasted*". In doing so he called attention to "a change in the Government patent policy which liberalized the private use of Government-owned patents" which he approved by Executive Order in August 1971.¹³ He stated further: "I directed that such patents may be made available to private firms through exclusive licenses where needed to encourage commercial application." This was a tremendously progressive step in the direction of increasing the utilization of patented inventions for which I am happy to salute him. This step was a giant stride toward overcoming the divisive forces arrayed within the various government departments and agencies which have been charged with administering rights to patented inventions arising out of research which is at least partially subsidized by federal funds.

I trust you will forgive me for making a personal claim to satisfaction at this point. Just as I did publicly in 1967 for the first time, when I addressed the Licensing Executives Society at its meeting in San Francisco,¹⁴ so do I now recall the fact that almost 20 years ago I originated or advanced the concept which President Nixon has now embraced, and later gave to it the name "utilization theory." While others concerned with the disposition of rights to government-subsidized patented inventions advanced the "fairness and equity" concept, I argued that utilization was far more important. Others advocated the importance of deciding, as a matter of fairness and equity, whether the government or its contractors should keep title to inventions made in the performance of contracts for research and development, based on relative contributions made by each party. I advocated that even more important to the nation as a whole was the decision as to how the inventions could best be utilized to promote the progress of the arts and sciences, with the conclusion that this could best be done by leaving a defeasible title with the contractors. If they put the inventions into commercial use within a certain number of years, they would keep the title until the patents expired; if not, title would revert to the government which then could license others under the same conditions.

¹³ Memorandum and Statement of Government Patent Policy issued by President Nixon on August 23, 1971 (36 Fed. Reg. 166, August 26, 1971). This statement revised and updated the original policy statement issued by President Kennedy on October 10, 1963 (2 Fed. Reg. 200, October 12, 1963).

¹⁴ Forman, "Retrospections and Introspections Concerning Patents and Government Patent Policy", 49 J. Pat. Off. Soc'y 678 (September, 1967).

The key object, it will be noted, is to promote utilization of potentially valuable national assets.

This utilization theory has even wider application than I could have imagined when I first wrote about it and in the intervening years when I have promoted the concept through speeches, articles and other means.¹⁵ It clearly should not be limited to patented inventions arising out of government—sponsored research and development: it should be applied to *all* patented inventions. After all, a patented invention is just as much a potential asset to the nation whether it was conceived with federal aid or in the performance of a complete non-governmental projection without federal subsidy. What, then, should be done about the terrible wastes of patented inventions that result when patents are invalidated by the courts? Since the Supreme Court re-defined the legislative standards of patentability in the case of *Graham v. John Deere*¹⁶ six years ago, over 72% of all patents litigated in the Courts of Appeals across the nation have been held invalid.¹⁷ This figure should be compared with the 57.4% of patents invalidated by the courts in the period 1953-63.¹⁸ Another interesting statistic is the fact only two patents have been held valid by the Supreme Court in the last 25 years.¹⁹

In a rather thought-provoking paper, Robert J. Fay, a Cleveland patent attorney, inquires: "A patent—A Civil Right: Is It Being Discriminated Against?"²⁰ Fay points out that a patent is a right granted by the Constitution, but, it is a right which is being abridged by judicial fiat. Patentees, he notes, are a minority in our society and their patents are rights which are as sacred to them as are the rights for which other minority groups have sought and obtained protection under our civil rights laws. Further, he suggests, the rights of inventors to the fruits of their creations "are just as sacred as the

¹⁵ Following is a list of publications and record of testimony by H. I. Forman before various Congressional committees, all on the subject of Government Patent Policy, in which the "utilization theory" was proposed and has since been developed in some depth:

Publications

- a. "Government Ownership of Patents and the Administration Thereof" (27 Temp. L. Q. 31 (1954)).
- b. "Patents—Their Ownership and Administration by the U.S. Government (Central Book Co., New York 1957).
- c. "Federal Employee Invention Rights—What Kind of Legislation?" (40 J. Pat. Off. Society 468 July 1958).
- d. "Wanted: A Definitive Government Patent Policy," (3 PTC J. Res. & Ed. 399 (Winter, 1959), reprinted in Forman, ed., Patents, Research and Management, 509 (Central Book Co., New York, 1961)).
- e. "Forgive My Enemies for They Know Not What They Do," (44 J. Pat. Off. Society 274 (1962)).
- f. "Impact of Government Patent Policies on the Economy and the American Patent System," (Patent Procurement and Exploitation 181 (Bureau of National Affairs, Washington, D. C., 1963)).
- g. "Government Ownership and Administration of Patents," (Calvert, ed., "The Encyclopedia of Patent Practice and Management, 360 (Reinhold Publishing Corp., New York, 1964)).
- h. "President's Statement of Government Patent Policy: A Springboard for Legislative Action," (25 Fed. B.J. 4 (Winter, 1965)).
- i. "Retrospections and Introspections Concerning Patents and Government Patent Policy," (49 J. Pat. Off. Society 675 (1967)).
- j. "Government Patent Policy—Yesterday, Today and Tomorrow," (50 J. Pat. Off. Society 32 (1968)).
- k. "How the Chemical-Pharmaceutical Industry Views the Government's Patent Policy," (25 Food, Drug, Cosmetic Law Journal 204 (1970)).

Testimony

- l. Hearings before House Subcommittee No. 3 of Committee on the Judiciary on H.J. 454 re "Rights of Government and the Employees in Inventions Made by Such Employees," pp. 2, 3 (March 3, 1958).
- m. Hearings before Senate Subcommittee on Patents, Trademarks and Copyrights on S. Res. 55 re "Government Patent Policy," pp. 452 and 580 (May 31, 1961).
- n. Hearings before Senate Subcommittee on Patents, Trademarks and Copyrights on S. Res. 48 re "Government Patent Policy," p. 470 (July 6, 1965)—republished (with foreword by Francis Bover, Chairman of Board, Smith, Kline and French Laboratories) in 45 J. Pat. Off. Society 787, 789 (1965)).
- o. Hearings before Commission on Government Procurement Study Group No. 6, Wash., D. C., July 29, 1971.

¹⁶ 383 U. S. 1 (1966).

¹⁷ Gampeswicz, R. L., "Brief in Support of Proposed Amendment to Sec. 103, Title 35 Patents U. S. Code," Patent Law Association of Los Angeles, p. 8.

¹⁸ Calvert, R., "The Encyclopedia of Patent Practice and Invention Management," p 23, Reinhold Publishing Co. (New York, 1964).

¹⁹ The Jones patent in *Graver Tank and Mfg. Co., Inc. v. Linde Air Products Co.*, 339 U. S. 605 (1960), and the Adams patent in *United States v. Adams*, 282 U. S. 339 (1965). The last patent previously found valid by the Court was in a 1945 decision.

²⁰ Unpublished as of the time the present paper was prepared.

right to equal protection of the law and the right to freedom from discrimination are to the ordinary citizen. The taking of an invention from one by an eroding judicial process, i.e., by discriminating against his invention, is just as much a removal of his constitutional rights and he is discriminated against just as much."

Whether or not one agrees with Fay's premise, the fact remains that each patent a court holds invalid represents one more invention which may not be brought to commercial application or to its fullest possible utilization because its originator, assignee or licensee generally will refrain from investing sizeable sums to develop something that anyone can freely imitate after the development has been completed. As President Nixon said, "an asset unused is an asset wasted." Who is to answer and be held accountable for all these potential assets which the federal courts send down the drain marked "patent invalidity?" The Patent Office has for decades been admonished by the courts, by the Congress, by the Executive Branch, by industry, by inventors, by patent attorneys, by just about everyone, to issue patents which will not be held invalid when subjected to judicial scrutiny. The record of patents in the courts clearly indicates the Patent Office is not succeeding in meeting that goal. That poor record, incidentally, appears destined to become worse each year as the Justice Department's Antitrust Division steps up its efforts to attack patents, even those not accused of being misused in violation of our antitrust laws, but are alleged to be invalid on other grounds.

What are some possible remedies to this unhappy situation? Several have been suggested by Fay and others.²¹ One solution which I have been vocal in supporting from the time it was first proposed is the "Ex Parte Opposition" provision which constitutes Recommendation XI of the Report of the President's Commission On The Patent System,²² and has been incorporated in Senator McClellan's current Patent Revision Bill.²³ This provision calls for a citation period of six months after the Patent Office publishes an application for patent otherwise found to be allowable, before the grant is made final. In that period anyone openly or anonymously, can call to the attention of the Patent Office any reference or fact which could cause claims previously found allowable to be rejected. Once this provision is enacted into law the courts should find it possible to place greater faith in the results of the Patent Office's examining procedures. Thereafter, issued patents will be considered not only to have cleared past the searching scrutiny of trained Patent Office examiners, but also the watchful eyes of the members of the public who are likely to be adversely affected by issuance of patents to others in their fields of interest. Even attorneys in the patent unit of the Justice Department's Antitrust Division may find this an excellent aid in their campaign to prevent invalid patents from being granted and thereby become capable of being used to limit competition.

As a supplement to "Ex Parte Opposition" I have another proposal to make, one which I believe deserves very serious consideration by all concerned with maximizing the utilization of patented inventions and diminishing the waste of potentially important national assets represented in patents which are commercially unexploited because they have been judicially invalidated. This proposal, taking a page out of the Lanham Trade-Mark Act,²⁴ is to make patents incontestable under certain conditions after a prescribed number of years.²⁵ My thought is that the grantee of a patent having the 17-year term of our present patent statutes would have the opportunity to make an election at the end of, say the 5th year following issuance of the patent. By simply making applica-

²¹ Cf. Vojacek, J., "A Survey of the Principal National Patent Systems," Prentice-Hall (New York 1936); and Fortas, "The Patent System in Distress," 147 IDEA 571 (1971).

²² Report issued on November 17, 1966 responsive to E. O. 11215 which established the Commission on April 8, 1965.

²³ S. 643 (92nd Cong., 1st Sess.) § 191, 1971.

²⁴ P. L. 489 (79th Cong., 2d Sess.) 1946.

²⁵ The basis for this proposal was derived from a recommendation made by the American Society on Inventors, through their spokesmen Dr. E. Burke Wilford and Albert G. Ponda, in testimony at the Hearings on the Scott Amendments. (Cf. Record of Hearings before Subcommittee on Patents, Trademarks and Copyrights, U. S. Senate, on S. 643, S. 1253, and S. 1255, Part 2, p. 444 (May 13, 1971). Their recommendation, which they declared was similar to a provision in the Japanese patent law, was to set a limit of 6 years after patent issuance within which patents could be attacked. In private conversations with them later, they suggested to the present writer that after that time the patents could only be attacked on the grounds of fraud having been committed in the prosecution thereof through the Patent Office.

tion to the Patent Office the patent could be recorded as being incontestable thereafter for any reason other than proof of fraud having been committed in the process of obtaining the patent grant. In exchange for this mantle of incontestability the patentee must agree to having the term of his patent foreshortened to a total, say, of 12 years. If the patentee chooses not to avail himself of this opportunity to make this election, the patent will be eligible to run to its full term of 17 years but will continue to be subject to the same attacks and risks which have contributed to the high invalidity record discussed previously.

To those who may instantly react against the notion of incontestable patents as being undesirable for one reason or another, let me remind them that the provision therefor would be coupled with the public opportunity to attack them in Ex Parte Opposition stage. To those who are loathe to accept the concept of patents being incontestable even though "the perfect reference" to invalidate them is found too late to cite during the opposition period, I would sympathize with their personal loss but I would take solace in the thought that the public-at-large may derive numerous benefits. I submit that, just as been pointed out in the comparison made between the benefits of pollution abatement vs. their costs, the very high costs to our national economy of having "100% valid" patents may exceed the gains which we have heretofore thought were received by safeguarding the public against all "invalid" patents.

Incontestable patents can materially reduce the workload of an already overburdened federal judiciary, for one thing. But even more important is the likelihood that the inventor, the patentee, the assignee all will be in a really secure position for the first time in our history to make important decisions such as whether to invest sizeable sums of money in erecting a plant to produce a patented invention. No longer will they have to worry about the likelihood of their patents being attacked and invalidated. With such assurance development of patented inventions, both technological and commercial, will be able to proceed in an orderly, logical fashion as never before.

Of course, if a patent owner is confident that his patent is invincible or at least is willing to take the risks involved he need not take the shortened term route, and can seek the benefits afforded by the full 17-year patent life time.

Why the option? What's the rationale underlying the shortened term? The term of a patent grant is arbitrary, to begin with, and varies from country to country. Whatever the full term provided by law, the provision of an election of a shorter term can produce certain socially desirable results. Reduction and savings in court time and expenses to all parties concerned in litigation is one such result. Increasing the likelihood of commercial exploitation of patented inventions—the avoidance of wasted assets in the form of inventions that no one cares to exploit because they are not protected by patents—is another. A third, of course, is that the shortened term will place the patent in the public domain years earlier than at present, thereby increasing competition but doing so only after the patent owner has had a reasonable lead time to recoup his investment and make a deserved profit.

If our laws are changed to provide for a patent term of, say, 20 years from the date an application is filed²⁶ (rather than the present 17 years after patent issuance), the proposal for incontestability could be adopted with certain modifications. As a nucleus for discussion I would suggest that the election and application for incontestability could be made by the 8th year following the filing of the patent application, and the patented term then would be foreshortened to 15 years from the application filing date.

Coming back to statements I made earlier, I again call attention to the tremendous wastes in precious manpower, time, financial and other national resources, first in the patenting process and then in the courts, not to mention the discouraging wastes in time and money spent for research and development leading to products and processes that never become properly commercialized for lack of sound patent protection.

I call attention again to the need for better utilization of the great national resources potentially represented by inventions that require the shelter of patent protection in order to promote their development. I again echo President Nixon's words that "an asset unused is an asset wasted." I will add that un-utilized inventions may be among our country's most wasted assets, and

²⁶ S. 643 (92nd Cong., 1st Sess.) § 154 (b), 1971, calls for just such a provision.

they contribute all too heavily to the economic pollution that inhibits and stagnates our national prosperity. I suggest to the President that he take steps within the Executive Branch to establish a unified, single policy of his Administration which will balance the implementation of our patent laws and our antitrust laws so as not to favor one or the other, or individuals who might personally benefit from one or the other, but rather will maximize the beneficial effects of both to the nation as a whole. And lastly, I suggest to the Congress that it should expeditiously consider adopting such legislative proposals as I have advocated in order to increase the utilization of patented inventions.

If the Patent Office continues to grant patents under the present laws, the Antitrust Division continues to attack them, and the courts continue to invalidate them, all without regard for the net effect on our national prosperity, it is high time to start a patent/antitrust ecology movement. After all, this is the Environmental Decade, isn't it? And when we start, let's learn from the blunders and findings of the environmental ecologists; let's avoid collision courses²⁷ and let's eliminate seeming remedies for one aspect of our economy's problems which only result in causing other adverse effects upon our economy and our nation's economic health and welfare.

WASHINGTON, D.C., September 27, 1973.

Hon. JOHN L. McCLELLAN,

Chairman, Senate Judiciary Committee, Subcommittee on Patents, Trademarks, and Copyrights, U.S. Senate, Washington, D.C.

DEAR SENATOR McCLELLAN: I offer comments to be considered by your subcommittee and for the record.

My comments are primarily additive rather than cumulative to those already received by the subcommittee.

I wish to help provide the best possible Patent Incentive System. All points herein considered made have been tested by whether our country will be a better one in which my children and theirs, and others, will live. In my book there is no special interest. The welfare of our country and to promote the progress of the useful arts, arts useful to make ours a better country, and one which will hold its own among nations for as long a time as possible is my goal!

Tested against such a template the answer for every legislative provision must be that it will increase or at least not diminish the incentive to innovate, to disclose in a patent application, especially so in cases in which through shortage of funds, or otherwise there is a tendency and real possibility for secrecy rather than for disclosure. All people do not function identically. It is clear that therefore a broad picture should be taken so that optimum, rather than perfect, legislation is the goal.

I have viewed each patent revision bill, beginning with S.1042. As you know, I have been active in and a chairman of a number of committees in industry and in the patent bar. I have a record of over 20 years patent legislation work; have organized and coordinated many efforts both directly and indirectly involving legislation; and have been on and have chaired patent legislation committees. Presently serving on the Council of the D. C. Bar, PTC Section, I am the liaison for it with our Patent Legislation Committee. I am a

²⁷ It is encouraging to note that this objective is shared by the Justice Department's Antitrust Division. The Chief of its Patent Unit, Richard H. Stern, Esq., makes this clear in a talk he gave on October 7, 1971 before the Practising Law Institute in New York City entitled "Harmonizing Patent Law and Antitrust Objectives", 47 PTOJ D-2. In the principal area of conflict between patent law usages and antitrust law enforcement, namely patent license limitations, such harmonization can perhaps best be accomplished in ways succinctly expressed by Professor S. Chesterfield Oppenheim in "The Patent-Antitrust Spectrum of Patent and Know-How License Limitations: Accommodation? Conflict? or Antitrust Supremacy?", 15 IDEA 1 (Spring 1971). Prof. Oppenheim concludes that article as follows:

"...I recapitulate three fundamentals for accommodation of public patent policy and antitrust policy related to license limitations:

"First, I preserve to the patentee the full reward to which the exclusive rights of the patent grant entitle him within the scope of the claims of his patented invention.

"Second, apply the antitrust laws *only* when there is proof of plus antitrust elements arising from restraints beyond the exclusivity bounds of the patent grant.

"Third, reject the fallacy that federal patent policy preempts licensing for royalties of trade secret or secret know-how and continue to protect valid secret proprietary information pursuant to long-established federal and state judicial precedents."

member of the Antitrust and Trade Regulation Committee of the Chamber of Commerce of the United States.

I speak from a background of childhood in which I saw my father lose his health in seeking to protect his invention; patent applications covering which finally stood between him and the entire loss of it. He won because of the security of his patent position, that is, a position which *secured* to him his *inherent right* to his invention. The record is known. I will not here repeat it.

I say with humility that I am probably as qualified to speak on the "incentive" of our great United States patent incentive system as perhaps any other living person. I feel that a person such as myself should not remain silent at this crucial time in the history of our country. My motivation to speak out is set forth herein.

I view the present patent law revision bill with misgivings because I do not see the kind of provisions which, on the whole, on balance, I can accept as being truly for the betterment and welfare of our country.

Accordingly, the comments I offer are set out with the hope that those who view the system as I do will consider and be persuaded to adopt them. If there is not agreement with all points, hopefully, these comments will have served at least for the betterment of the functioning of our Patent Incentive System and therefore our great United States.

In reading these comments I ask you to be ever mindful that the 77 million dollar Patent Office budget is relatively so small compared with "welfare" systems and schemes of our federal government that any increase or decrease in costs accomplished by legislation can be ignored. As you know in your capacity as Chairman of the Appropriations Committee, we are, today, appropriating tremendous amounts for all kinds of government operations which are legislated by Congress for the "welfare" of our country.

You need not be reminded, Sir, that comparing the relative merits of such welfare legislation with the Patent Office functions there is no doubt that the Patent Office is as essential as the best of the welfare programs.

Patents make jobs, which make incomes, which make taxes. The patented inventions ultimately make better living for all through progress of the useful arts. These patented inventions stimulate that progress.

The jobs, the processes, products, and other benefits for better living and national defense motivated into existence by our great United States patent incentive system are legion. This makes the Patent Incentive System the root of real welfare for the citizen and his country. Even at this late date, in the operation of our very old but good system, this needs to be told and repeated. The taxes for providing the non-patent system schemes of our government are generated in large part by the operation by our Patent Incentive System, as you know.

Much revenue in this country, as well as coming into it from abroad, results from patent protection here in the United States. A U.S. inventor must secure his rights here, for usually the real market for it, for him, is here. Unless in such case he has protection here he cannot afford to reveal his invention abroad.

I have read the statements and have heard every word of the testimony presented to the subcommittee September 11, 12 and 14, 1973. I am pleased that some of my work has been reflected to the subcommittee.

1. I believe that no legislation, even resulting from the no doubt well considered Administration bill, should be enacted until the public, preferably in public hearings, has had an opportunity to develop its ideas, suggestions and possibly even better principled provisions. I urge you to provide hearings on any new bill introduced whether by the Administration or any other group of citizens.

Such hearings should not be open to review specific provisions on which those concerned have been heard. There should be time to put forth positions and arguments on real departures either from present law, or priorly reasonably considered provisions of early bills.

2. S.1321, undoubtedly introduced with the welfare of our great country in view, contains provisions improving the stature of the Patent Office which I can accept. For the most part it contains provisions, on only some of which the public has been invited or permitted to comment reasonably and at the hearings, which I and great many others, including the Administration, cannot accept. Please note the addendum, later discussed.

I will give one glaring example which has not been discussed at the hearings.

S. 1321 would not permit a patent for an "obvious" solution for a *discovered problem*, the "discovery" of which, today, is considered patentable under the law and cases. Such a provision in S. 1321 is evidence of a need to further study the essence of patentable invention as therein defined. There are other less readily noticeable but equally important departures in S. 1321 on which no hearings were held, e.g., making public abandoned applications.

Other unacceptable provisions exist in S. 1321. I ask whether you think that a prior public use, known only behind the Iron Curtain, should defeat a patent when it becomes available in this country only after deep, expensive, time-consuming search conducted with a view to defeating a U.S. patent. Has the constitutional "... progress of the useful arts ..." been promoted by the use unknown in this country prior to the publication of the patent?

The broad picture requires that public consideration be given to such provisions.

3. In 1966 the Administration Bill S. 1042 introduced by you by request was surprise to almost all of industry, including the patent bar. There ensued a year of great tension between the Administration and the bar representing the industrial, inventive community. I am glad to say that I initiated and had an active part in the "reconciliation" of September 18, 1967, following a hard summer just prior to which was held in April the emergency meeting of the American Bar Association, Patent, Trademark and Copyright Law Section in Washington, D.C., attended by over 400 members. Your ably conducted hearings of May 1967 then followed.

The Administration Bill submission is understood to involve about 280 pages, which must needs be reviewed by those who are truly concerned. Time must be available to study, to comment and to be heard.

Clearly, any rush to legislate should be moderated by the United States of America way of affording the interested citizens opportunity to publicly present their views.

4. I believe that patent system reform should be accomplished to include licensing of patents which should now be clarified and stabilized by statute, so the public and the courts will know better what can or cannot be done with rights which are secured by patents. Let's go the whole way and have better Patent Office functioning and a better, more fruitful progress of the useful arts with licensing in a clarified, stabilized climate. The Congress has the plenary power and duty to proceed on this basic sine qua non! I am among those who believe that there is time, if the Administration so chooses, to bring in an amelioration of the present licensing situation which adversely affects the rate of growth of our economy, especially now so badly needed when virtually ever-present inflation is all but rampant! I incorporate by reference the points of my letter to you, printed page 647 of the record of the May 13, 1971 hearings. For the economic posture of our country both here and in a world of nations, there should be statutory guidelines now! If it truly appears that the bill to be reported out cannot be achieved with licensing provisions I bow to the inevitable but must urge inclusion of such amendments when the Administration is indicating that the Department of Justice and Department of Commerce soon may come to agreement on them.

I believe that the system needs to be revised, not just the operation of the Patent Office. The laws and rules now on the books have well served the operation of the Patent Office. The testimony and statements before you show that reduction, of the only 25 percent of litigated patents being held invalid, can be obtained if the prior art is available to the examiner. All parties agree that the law should provide the means for getting the art before the Patent Office. This can be done simply 1. without full scale adversary oppositions as are now largely anathema abroad; 2. without a public counsel in the Patent Office who as a "big brother" to the Commissioner of Patents, reducing his status, would have to examine each application for patent to avoid *two standards of validity or discrimination* (a second Patent Office examining staff!); 3. without the administrative burdens attendant the manifold new steps provided, and 4. without the many other burdens which, as related by the witnesses, are built into S. 1321.

In passing, a point of extreme importance in considering validity of patents is the time it takes to develop the secondary tests of patentability set out by

the Supreme Court. Another point: even if sanctions are imposed for not opposing the issuance of a patent, assuming a party-litigant has the art and the interest at the time set for protesting the issuance of the application, it is clear that the courts in the public interest will permit him to bring in his prior art.

5. It is time that the record of validity of the patents issued and litigated be emphasized in contradiction to those few who talk without statistical facts or who are repeating alleged statistics. As can be gleaned from the statements of some of the witnesses and from at least one written statement furnished to the subcommittee the patents held invalid over art already available to the Patent Office are only 25 percent of those litigated. As seen in the U.S. Patents (Quarterly Reports, in the period 1968 through 1972 the courts considered 880 patents. The number of patents issued during that period is of the order of 75-80,000 per year. $(75,000 \times 5 = 375,000 \text{ patents—Surely } 880 \text{ is a very small percentage.})$ To scale up from these few obviously selected patents is not warranted. Obviously, only a patent which already is of doubtful validity is taken to court. The reasons for doubt are 1. there is a disagreement between patent lawyers on opposing sides as to the teachings of the art available to the Patent Office, 2. there is new art which the defendant's lawyer believes will invalidate the patent, 3. in a small number of cases, there is some other issue on which both sides think they can win, and 4. the judgments of reasonable men can and do differ.

Former Commissioner of Patents Edward J. Brenner testifying, aptly remarked to the Chairman conducting the recent hearings that even the Supreme Court decisions, oftentimes, are 5-4 or otherwise split. Yet the matter of human judgment is ever present, even in patent matters. Of the 25 percent of the litigated patents held invalid, in cases in which the art available to the court was also before the Patent Office, there are the patents on which judgments of the court and those of the Patent Office examiner or the Board of Patent Appeals in the Patent Office or of the court which may have in effect granted the patent, are simply different. This can be quickly agreed when the split decision of the courts on obviousness of invention are considered.

No system will be devised which can avoid imprecision or lack of sameness in the exercise of human judgment so that of the "25 percent" patents litigated there are unavoidably some invalid patents.

So let's look to the positive results of the United States patent incentive system and tread lightly before we make drastic changes in it.

6. It can be said with assurance that the provisions of S. 1321 designed to avoid fraud or unclean hands are far too burdensome on the Patent Office and on the applicants and, therefore, on the country relative to the good such provisions may accomplish. It is thought the Administration bill may, in part, be evidence of over-reaction to insufficiently warranted criticisms.

There are laws on the books to deal with fraud or unclean hands. Witness the patents which are held invalid for the very small number of humans who intentionally seek to obtain a patent improperly. In the 880 patents above mentioned, only 66 had allegations of fraud or unclean hands. The courts held fraud or unclean hands in only 17 cases! I.e., only 1.94 percent of the 880 patents considered. Though provisions of S. 1321 may appear well founded, the use to which adversary proceedings, or public counsel, as defined, can be put, practically, cannot be expected to have a substantial effect on validity. Why burden the Patent Office, the applicants and our country with the great cost of lesser invention and lesser disclosure at a time when our country needs innovation so badly?

7. The allegation was voiced that examiners are allowing cases due to pressure of the disposal system. This allegedly results in invalid patents. It is implied that the examiners of the Patent Office are so lacking in good faith, intellectual honesty and professionalism that they would allow a case just to make disposals. It was stated in effect, that the rate of disposal had increased because of the allowance of more invalid patents. No mention was made that during the period in question the staff of the Patent Office, which has had at much earlier times a turnover of about 20 percent* each year, had been stabilized by better working quarters, better status, better pay and increased

* Now of the order of about 6-10 percent.

responsibilities! The examiners as a group are now more skilled not only in the patent law and practice thereunder but in the art which they can and do search more rapidly. So knowledge and experience do count; the small increase in the rate of "disposals" surely can be traced to such better staff in the Patent Office!

Abandoned cases and counted as "disposals." An Examiner's Answer on Appeal also is counted as a "disposal" (but not for the reduction in office inventories). Thus, about one third of the "average" examiner's disposals are not allowances.

That the "young examiner studying law" can be importuned to allow an unpatentable case should be documented with actual case histories. In my long and wide experience in a great many sections of the Patent Office, the young examiner has been most difficult to convince and has ordinarily held to an unnecessary, higher standard of invention than the more experienced ones who have become more sure that they are correctly deciding the issue. The relatively inexperienced examiner is, ordinarily, less impressed by the invention when he sees it after viewing the art. He applies more "hindsight" at this time of his career than he will later!

I have worked in patent prosecution since I was twelve years old. Today I am almost 59. I have been intimately associated with or have directly presented, prosecuted, supervised and trouble-shot hundreds of cases. I do not recall a single application—and I dare to say readily none can be found—in which the Examiner allowed the case without a real basis other than "a quota system." It is just as easy to send the applicant a final action or to appeal as not to do so. And the affirmances or reversals on appeal tell the story about quality. In my view, many cases which have patentable merit are abandoned simply because lack of funds and manpower available to the inventor precludes appealing all cases. I agree with the Patent Office Society spokesman that the U.S. Patent examiner will not allow simply because of a disposal system quota.

All human endeavor is measured and we all do or should work toward reasonably established goals.

An interesting fact, which I seek to underscore, is that my experience in supervising and training patent lawyers clearly makes evident that the persons producing the higher number of cases and disposals almost always are those who do the higher quality work. I have observed this to be true for over 25 years of record keeping! Of course, all quota systems should be equitable in assigning points of credit for quality as well as for quantity. I believe, from rather close association with the Patent Office and a good number of the members of the staff, as well as intimate knowledge of persons who are high quality producers there, that they are usually the high quantity producers.

Suffice to say, when the Chief Counsel asked a witness for evidence of the increase in the "hordes" of invalid patents being issued, the witness had none to offer! I will not dwell on the clearly unfounded allegations of the witness save to point out that those who have presented statistics have given their evidence which can be checked readily. I know that the Subcommittee of our great Judiciary Committee will not act on unfounded "testimony." It will ascertain the facts.

8. Generally there is a great deal of "shop talk" or "gab" in the profession of patenting. Much of it is repeated on a hearsay basis. People who are otherwise learned and careful use poorly chosen words and phrases, quite loosely, to describe what they think is a fact—without really knowing it. Incomplete presentations must be viewed critically.

Although there is always room for improvement, when a thorough analysis is given it is at once evident that the vast majority of U.S. patents are validly issued and, importantly, that the progress of the useful arts is now well promoted by the system. More especially this is so when the total picture is viewed:

(A) The Patent Office terminates the prosecution of only 70 percent of applications filed by issuing a patent.

(B) Allowing even for differences in judgment or opinion of reasonable persons, the Patent Office Board of Appeals affirms on the order of 75 percent of the examiner's actions rejecting claims. This is a high percentage, encouraging the examiners to reject claims. And the Courts affirm on the order of 70 percent of cases appealed from the Board of Appeals. Again, a high percentage encouraging a good standard of patentability.

It would seem then that the case is made that a few squeaky wheels (cases which are notorious because of some fact or personality) do not signify that the lubricants supplied the millions of wheels in the world are unsatisfactory. Likewise, the entire operation of the system cannot be seen by scaling up from that very small minority that are notorious cases. The possibility for multiplication of gross errors is too great! Even on scale-up, however, the positive value of the system—which has truly served the country as we know—is still evident!

This letter would be grossly incomplete if it did not urge that the remedy for the "problems" lies primarily in supplying the art to the examiner and in heavily punishing the few who are intentionally dishonest.

S. 1321 proposes a much greater burden be placed upon the public in its dealings with its government than in any other public dealings simply because, admittedly, there will always be dishonest persons amongst us.

9. The great majority of the chemical or chemistry-related inventions now sought to be patented are of non-reverse engineerable nature. This means that such inventions can be guarded as secrets if obtaining a patent is fraught with too much difficulty or if an application can result in public disclosure without obtaining a satisfactory patent. If kept secret, the "hordes" of scientists, chemists and engineers cannot know of them. These people will not be able to apply their talents to improving such inventions or to inventively designing around them. These remarks apply not only to the esoteric "chemical" inventions, but also to such inventions in electronics based upon esoteric treatment of materials, such as transistors, filaments, tubes, alloys, getters, and the like. Even in mechanical contrivances, there are assembly or adjustment "tricks of the trade" which may be held secret.

Accordingly, the publication of abandoned applications for patent should not be permitted except in special situations substantially as now provided in Section 122. This matter is now on appeal in the Fourth Circuit from a decision of the U.S. District Court in Alexandria, Virginia in a civil suit. Several associations, companies and persons presented information and arguments in the trial in support of the Patent Office which sought to prevail under the constitutionality of the Section. Section 122 should not be changed without careful consideration.

Under every circumstance the applicant or his assignee should have the full right to abandon his application prior to publication and maintain confidential his information disclosed in it, even after allowance of claims, if he is not satisfied that the system is securing to him his right to his invention or discovery as provided in the Constitution. See Congressional intent in Freedom of Information Act relating to receipt by government of information in confidence. Guaranteed this right, inventors will continue to come forth to seek patents.

10. A witness was asked by the chairman at the hearing why the business community does not sound off about the unsatisfactory nature of the product of the Patent Office. His response, which is not worthy of repetition, is in the record. The question made an erroneous assumption that business generally does not approve of the product of the Patent Office. Those organizations and persons who cite pertinent art to the Office and who prosecute vigorously on all issues, as can be documented from the files of issued patents at the Patent Office, will disagree that they are dissatisfied with the product. Their dissatisfactions are not of the general kind intimated by the chairman at the hearing.

Generally business wants to plan on a sound basis. It cannot go ahead on invalid patents and does not do so intentionally. Again, the broad picture must be viewed.

In closing this letter I am not to be understood to deny that much improvement in our Patent Incentive System is possible. However, the record should show the relative unbalance of the testimony with regard to points made in this letter.

S. 643 as distinguished from the "committee print" was a good bill. The Administration and the proposed bar bills have made additional changes which upon careful examination may be found to add improvement. S. 643 is more in tune with the reality of the administrative and functional operations of the Patent Incentive System, including the Patent Office, the licensing of patents and the judicial reviews of the patents and licensing arrangements involving patents.

There is attached to this letter an addendum noting a number of points relating to provisions of S. 1321, not noticed for hearing. Several statements,

presented at the hearings, made reference to such provisions of the bill as requiring study and hearings. Some alluded to a few points in this connection. No statement was addressed to the manifold provisions which are a departure from any bills earlier considered and from the present law. These comments and addendum are simply submitted so that the record will show that the bill, in my view, require additional study and hearings and not by way of being comprehensive or the result of final study of each provision of the bill. Indeed, the comments, prepared early in May, are not intended as final, but as notes with a view to initial preparation for hearings on the manifold principal *new* provisions of the bill. It is hoped that further study and hearings will be permitted before the subcommittee adopts provisions a good number of which are now viewed by me to be most likely disincentive in character.

I ask that this letter and its addendum be printed in full in the record as my personal reaction to the bill, statements and hearings of September 1973.

Thank you kindly.

Respectfully submitted.

PAUL L. GOMORY.

P.S. The Administration bill, just in hand, in which certain key provisions have been read, will, it clearly appears, require considerable comment, upon further study!

WASHINGTON, D.C.

P.S. To my letter of September 27, 1973, I am attaching my reasons for having patent licensing provisions as reprinted in the May 1972 ACTION. Please print this as part of my letter.

PAUL L. GOMORY.

JOURNAL OF THE ASSOCIATION FOR THE ADVANCEMENT OF INVENTION AND INNOVATION—MAY 1972

PATENT LICENSING PROVISIONS

The time for action is now. I urge that the separate action be supported by all interested parties for at least the following important reasons.

1. *Consumerism*.—the consumer will benefit because the exchange of technological information taking place under increased licensing, as herein discussed, will permit to be produced by American industry better and lower priced products. This will lead to more competition.

2. *Fight Against Inflation*.—the production of better and lower priced products will aid in the fight against inflation since these products will compete for the increased flow of dollars.

3. *More Jobs*.—more jobs will be created because there will be more inventions and/or products to be produced or to operate.

4. *More Pay To Labor*.—because the new improved technology will reduce other production costs, more will be left with which to pay labor increased wages.

5. *Increased Competition Here At Home Among Domestic Organizations*.—the increased spread of technology, even in field of use licensing, will in each field produce new and better products at lower prices and thus will increase competition in each field of licensing.

6. *Competition Here At Home Against Imports From Abroad*.—this is similar to 5 above.

7. *Competition Abroad By U.S. Organizations*.—this again is similar to 5 above.

8. *Environmental Improvement and Control*.—Clearly, items 1-7 will considerably aid the technological leap forward required to improve and protect our environment.

9. *Cities Problems*.—by no means least, there are the cities problems. There is the decay, crime, drugs and added problems.

We cannot expand the fund of technology quickly enough to deal with the listed problems—for example, to develop antidrug drugs. Yet, there must be incentive to the patent holder to license various fields of use and in each field to those who would most quickly and most effectively develop the invention in the respective fields.

The continued inroads causing attrition of the "incentive" of the U.S. Patent Incentive System by lessening the value of patents, which are being made by those opposing the kind of legislation here favored, are detrimental to the

solutions of the problems outlined above. When asked the question at the May, 1971, hearings, the Department of Justice spokesman could not point to any decision which would be overruled by the then discussed version of the Scott Amendments. Hearings May 13, Part 2, page 648, paragraph 2.

PAUL L. GOMORY.

COMMENTS ON S. 1321—HART

The following are preliminary comments. Reference to the present Patent Code, other bills or drafts should not be taken to mean that there has been made a word for word, line for line comparison at any time of anything which has been included herein.

SECTION 1

In line 4, the word "privilege" is not the word "patent". It is not a "privilege" which is to be granted. The word "right" appears in Article I, Section 8 of the Constitution. The patent secures this right under law.

SECTION 2

The establishment of the Patent Office as an independent agency will increase its exposure to the public and, generally, if properly operated, can be a tremendous influence for good of our country!

SECTION 3

In line 30, after the word "promulgate" the words—not inconsistent with law—would not have to be implied. The words are in the present Code.

At (d), line 14, page 3, the establishment of a Public Counsel will in effect establish within the Patent Office a second Patent Office and a second examining staff! The Patent Office operation will be hampered probably more than it will be helped. The budget of the Patent Office will have to be considerably enlarged.

Page 4, lines 7 et seq. the Public Counsel may be viewed by professional patent examiners and others in the Patent Office as constituting a "big brother." Supervisors now exist in the Patent Office. There is a Law Solicitor's office. After all, quality still depends upon persons—we have those persons now. There is a very real possibility that the Patent Office will be mired down in-fighting with itself.

At (d), page 3, line 34, apparently the Public Counsel will determine what is "important, new, or developing areas of technology." This could easily be applied to all technology since all technology can always be said to be developing. What a bureaucracy! It takes years to develop and to prove out which are the important cases—important in whose judgment?

In line 38, page 3, my copy reads in the margin "... another Commissioner of Patents!" Two standards of validity—two presumptions!

SECTION 6

Page 6, line 12, though the decision, which has been appealed, may change the Senator's mind or the minds of others on this point, the fact is that this Section provides for indexing abandoned applications. See also Section 122, page 26, of the Bill.

SECTION 8

At (f), lines 33-38, it is not a proper function of the Patent Office to disseminate information except by way of patents and trademarks and perhaps closely related matters. There is now an Office of Technical Services, a Library of Congress and a great many other government organizations disseminating "... public technological and other public information ..."

SECTION 10

At (b), page 8, lines 28-29, "... the quality of United States patents ..." gives rise to the possibility that the Council may study validity of specific patents and possibly all patents. This should be carefully considered.

SECTION 23

At (a), line 17, "evidence"—Does this mean that abandoned applications could be subpoenaed here if Section 6 and Section 122 have been redrafted to eliminate access to abandoned applications thereunder?

SECTION 41

At (c) (1), maintenance fees will be an impossible burden to meet for many small individuals or organizations. So will the burden provided for in line 32 and in line 35. The little fellow will have to divulge his finances. Will this be made public? The bureaucracy here will have a tremendous clout to apply to the little fellow and to his attorney, if he can afford one. If he cannot afford one, he is really in poorer shape.

SECTION 100

At (g), lines 26 and 27, this would make unpatentable "... any obvious variation of or on such known composition of matter or the structure thereof ..." whether or not the same is adapted for practicing a new use thereof." This is contra to the present law and cases such as *Deutsche-Gold*, *In re Papesch*, etc. which hold that unobvious properties or results might well be basis for a further product or a further process claim.

SECTION 102

Comments on this Section, even cursorily made, would take too much time and space for this preliminary memo.

"... other tangible form ..." as in (a) and (b) is simply impossible. There is nothing to show that the "tangible form" is reasonably available in such manner as to promote the progress of the useful arts in this country when the "tangible form" is simply available in some out-of-the-way place in some out-of-the-way country.

These subsections are in derogation of incentive to disclose here in this country.

"Use or knowledge abroad" is not use or knowledge in this country and should be most carefully considered. It is in this country that the progress of the useful arts should be promoted, according to the Constitution.

"... public use or on sale ... foreign country ..."—same comment.

The sections here discussed would require, and no doubt the courts would do so, to be interpreted and limited to "... reasonably available ..." in each case the reasonableness would have to be determined.

The subsections will probably be quite okay when all information is in a computer—years from now!

SECTION 102

At (e), lines 28–30, Section 119 gives benefit of earlier filing date in a foreign country.

SECTION 103

On page 17 in line 2, the meaning of "the prior art" will need to be determined afresh in view of changes in Section 102.

In S. 643, Section 103 reads "*such* prior art."

In the bill this section omits two sentences of S. 643, Section 103—these are important as instruction on intent to the courts.

SECTION 104

Limits severely the earliest date upon which one can rely in succeeding applications in (a) lines 7–12.

Subsection (b) is, in effect, a first to file system unless and until "... reduction to practice ..." comes into play. Note that the last quoted phrase is not qualified as to the kind or kinds of reduction to practice.

At (c), the phraseology here should be reviewed in light of Section 100(g). It can be understood that the realization of patentable invention having been made may depend upon at-the-time recognition of the particular property.

At (d), what about a formula or other incorrect disclosure which is unaccompanied by an "enabling" discussion or description?

At (e), this subsection would derogate from the incentive to find the problem to which *then* the solution would be obvious. Common ground on such a subsection and no subsection at all might be to require reciting the situs of the problem in the claim and limit the "obvious concept" to that problem to get a patent.

SECTION 111

In lines 3 and 10—differs from S. 643 which reads "invention" instead of ". . . the subject matter sought to be patented. . . ."

In line 15, (3), this requirement is new over S. 643.

Section 115 is quite detailed.

SECTION 112

Disclosure of all properties of results on which reliance will be based is required and for each claim the date of invention ". . . including any date of reduction to practice." What a burden! In *how many* applications is a date relied on?

The requirement in line 19 to disclose "all" know-how known is a tremendous burden. A telephone book may be needed unless data can be considerably condensed (at the applicant's and assignee's peril?).

Primary examiners could burden applicants with requests for affidavits on the slightest "basis".

In subsection (b) a statement in the specification of that ". . . which is obvious . . ." from the prior art puts quite a burden on the applicant and his attorney. What if it is not properly met? How much is "obvious" from how much prior art? Lines 33-36 impose an impossible burden—yet claims issued will be too narrow. This will send nonreverse-engineerable inventions into secrecy with a *return* to the "*guilds*" especially in chemical inventions—alloys—special treatments of metals and other esoteric operations.

At (d), the requirement that the preamble describe "all" of the elements (not even limited to "essential" elements) is a make work. Skilled in the art read the specification and claims. They have done so for years.

At (d), page 20, line 14, the words "some or all" are questionable. A subcombination within a combination should be here considered. Consider a gyro subcombination in an overall combination.

SECTION 114

At (c), new.

SECTION 115

The burden of this section is heavy. Not only do agents, attorneys and all other persons who participated and who are recognized under Section 31 need to file a statement, page 22, line 38, but each inventor must specifically identify which claim or claims he made where two or more inventors appear. See page 22, lines 18 and 19. Not to do so, it is possible, may later incur some penalty if facts prove otherwise. Thus, joint inventions will have to be carefully scrutinized in each case. However, this could be helpful in an interference where a named inventor could, without more, corroborate.

Note on page 23, Section 116(b).

SECTION 119

At (a)(2), lines 18 and 19. This will be an additional work for foreign agents and applicants who intend to file in this country.

SECTION 120

Page 26, lines 3 et seq. Appearing in the conjunctive, section (4) will require the second application to be filed prior to the filing of an appeal under Section 134. It would no longer be possible to file an appeal pending refile of a case to avoid losing early date!

Subsection (E) would seriously limit the filing of a C.I.P. This point should be borne in mind when reviewing in detail, Section 122.

SECTION 122

Additional to the comment made immediately ahead of this sentence note that abandoned patent applications ". . . and any papers filed during the prosecution thereof, shall be indexed and maintained available for public inspection."

tion and copying." On April 26, Judge Oren Lewis in the United States District Court, Alexandria, Virginia, decided against the Plaintiff in *Sears v. Commissioner of Patents*. An appeal has been taken. I, personally, could not advise a client where there is a chance of maintaining secrecy to file an application for a patent in all those cases where some real doubt exists as to whether the Patent Office (courts) will issue a patent. Note that under subsection (c) pending applications shall be published promptly for public inspection. There will be no secrecy at all! Most cases where ultimately an application is now abandoned filing in the Patent Office will be about like publishing an article in a trade journal.*

SECTION 131

Subsection (2), page 28, lines 3 and 4, is required patentability brief which places a burden on the Patent Office. The examiner should see the art cited by the applicant. Then, when the examiner applies the art is the proper time for the applicant or his attorney to make the argument. Admissions against interests, in the legal sense, should be considered here.

SECTION 132

Lines 19-21, the Public Counsel can be invited to participate in any proceeding.

On page 29 subsection (e), lines 11 and 12, would prevent enlarging the scope of claims of the application once filed. Presumably one could refile.

In subsection (f) will the examination by two or more primary examiners, paid for by the applicant, permit removal of much of the restriction practice?

SECTION 134

Appeals to the Board of Appeals will be inter partes and the Public Counsel will brief and argue the case before the Board with respect to "any appeal taken by any applicant" except in interference situations in which the participation of the Public Counsel "... shall be at his discretion." Primary examiners are not allowed to appear before the Board of Appeals.

Any party and this includes the Public Counsel may introduce new evidence before the Board of Appeals which may consider de novo or remand and under (d) the proceedings before the Board of Appeals are open to the public and a transcript of the hearing must be kept. So even before any claims are allowed the inventor may have un-"secure"d his "right".

SECTION 135

Opposition proceedings of a modified character are provided. The opposer notifies and if he wishes submits explanation presumably in writing of prior art and he can appeal and he can elect not to be identified.

During the period of Section 135, a later interested party will have ignored the procedure. If Section 135 is to be retained some protection against estoppel to assert prior art known at the time, but not made known to the Patent Office because of the then lack of interest, should be provided.

I do not see why simply placing the prior art of record in the patent file would not suffice thus placing the burden, like now, on those who would be interested in the validity of the patent. The proceedings are time-consuming, expensive and burdensome to the operation of the Patent Office.

I think to provide for anonymity of the "opposer" is a step backward in our form of society. Harassment especially of small business or individual inventors can be imagined.

SECTION 137

Harassment possibilities—also means must open the application to public. The little fellow will never make it!

SECTION 138

At (b), page 32, line 35, appears to provide protection for those who have "... failed to proceed in accordance with the provision of this title."

* See *Kewanee Oil Company v. Biron Corporation* (6th Cir. Ct. of Appeals), holding no protection for trade secrets.

SECTION 139

Settlement agreements would have to be filed in the Patent Office "... before the termination of the proceeding as between such parties." Further, the "... copy shall be made part of the public record of the proceeding." Penalty for failure to file "... such agreement or understanding ..."—patent unenforceable.

SECTIONS 141-147

On review of Patent Office decisions in the courts the Public Counsel is involved in Ex parte proceedings and at his discretion in priority of invention contests. Appeals from CCPA are to the U.S. Court of Appeals, D.C., by petition for allowing an appeal. No petition for certiorari unless such petition has been denied.

SECTION 153

Patent expires 12 years from actual filing date plus time application was deferred. This with two-year limitation to sue makes disclosure by patenting less attractive!

SECTION 185

Patent invalid if application made without procuring a license. No excuse for inadvertent failure to obtain license appears.

SECTIONS 191-193

Deferred examination. The bad experience abroad is considered by some to be persuasive. Deferred examination adds to the knowledge of the examiner. He is less likely with his much later "present day" knowledge to be able to stand, as required under Section 103, in the shoes he occupied at time invention was made, much less therefore in shoes of one skilled in the art at that time.

The possibility of harassment page 43, line 4, is noted. A party who is prolific in producing applications for patent but is of relatively small size could be made to undergo expenses of examination with no ability to prove any contention that he is being harassed. Anonymity in the patent law and practice thereunder should be preserved for applications, especially abandoned applications. This would kill a Polaroid or a Xerox!

SECTION 201

Page 44, line 3, dealing with reissues—this line it seems ought to include Sections 116 and 117 and therefore make reference to chapter 11. Or are the benefits of these sections intended to be excluded?

At (c), whereas the present code permits enlargement of scope of claims applied for within two years from date of grant of the original patent, this subsection permits no enlarging the scope of the claims of the original patent.

SECTION 263

This would require payment of minimum of two percent of profit or savings to employer attributable to employee for subject matter of an application for patent or patent, etc. Otherwise the assignment is invalid.

The Commissioner must establish "procedures and methods including accounting procedures ..." for giving effect to this section. Thus the employer would have to determine under governmentally established procedures the contribution of the particular subject matter. It does not appear upon a once-through reading of the section that a patent need necessarily have issued. See page 47, line 29.

SECTION 273

Page 49, lines 36 et seq, one need only make a heavy commitment on publication of the application to obtain a court-granted license of any patent which issues!

SECTION 282

At (d), page 51, line 20, "... any party of record ..." could be a counter-claimant who might be quite willing to abandon his counter-claim, without prejudice, if the claimant for some reason does not make out his case. This should be further studied.

SECTION 286

Suit for infringement cannot recover for more than two years prior to filing of complaint or counter-claim and in case of government the limit is four years. The present code in both instances gives six years. The shortened period of time may make it impractical for many smaller patentees even to recover the cost of the suit! The "incentive" of the United States patent incentive system is here considerably weakened!

Again, the foregoing is on a once-through reading—simply to get the gist of the bill.

HARBAUGH AND THOMAS,
PATENT LAWYERS,
Evanston, Ill., September 25, 1973.

THE CHAIRMAN AND MEMBERS OF THE ANTI-TRUST AND MONOPOLY SUBCOMMITTEE,
U.S. Senate, Washington, D.C.

GENTLEMEN: It would appear to be mandatory that if reform of the Patent Law is desirable then Congress will do that which well measures up to the principle and standard of Promoting the Progress of Science and the Useful Arts, and, more important, shall do nothing that does not promote the Progress of Science and the Useful Arts. If there is doubt on this principle about any item of reform, the answer should be No.

It is this writers opinion that there should be some reform. Enough experience is accumulating with patent systems of other countries who are endeavoring to catch up with the effects of the U.S. system that it may be time for the U.S. to improve to stay ahead.

Something could also be done to correct the U.S. word game approach to claiming an invention to an approach better portraying the inventive concept that is being protected as an assist to Courts and public considering infringement. Have Examiner indicate concept supporting allowance.

Regarding reform of the U.S. Patent System, it is my conclusion that the Federal Courts have shown the way to further promote progress. Extend their estoppel potential.

REASONS AND COMMENTS

No endeavor is made to be profound in these down-to-earth comments intended only to be suggestively helpful for a legislative body. but, the crux of the recurrent interest in the reform of the present U.S. Patent System appears essentially to be the suspected frequency of adjudicated patent invalidity over the last decade or so. This has occurred primarily because the Patent Office staff did not locate or cite the prior art upon which invalidity was ultimately determined in Court, plus the tendency of patentees in a "word game" to interpret claims narrowly for issuance and then broadly for infringement. For years the Patent Office has had very little exposure to the "new" prior art outside the Patent Office from which anticipations are drawn to the Judge's attention by defendants who possess the art. Incidentally, there are very few patents litigated as compared with the total number of patents issued, substantially less than one percent, and, this is also significant.

The Patent Office is doing quite well with its facilities, particularly where there is full cooperation of the applicants and attorneys on prior art known to them. But no patent office alone can cope with the vast burgeoning accumulation of new prior art occurring day by day let alone do "outside art" searching in the shortened examination procedure necessitated by the budget afforded the Patent Office. Invalidity based on new prior art could increase if something is not done about the prior art outside the Patent Office.

The critical reaction of Courts is expected. They are concerned in having to pass on extensive prior art that is cited defensively against a patent which should have been considered with the expertise of the Patent Office before the patent issues. They seldom consider patents where validity is admitted and licenses are taken or infringement avoidance is accomplished without litigation.

The questions for everyone is not "will" but "what" can be done about it. This would not be the first nor the last time Congress reformed the potent statutes.

It would appear that the proposed Hart Bill is a conglomerate of all suggestions that have been made over the last decade to see where they rank at the present time with respect to "promoting the Progress of Science and the Useful Arts." Some suggestions therein would be steps forward and others would be steps backward; some are not likely to promote progress while others do hold promise by way of worthwhile reform to promote even greater progress. Care must be taken, and, apparently reactions of patent lawyers in the field of practice are welcome even though a full scale research has not been conducted by the legislators upon which a scientific approach to the problem could be made. For instance, the writer is unaware of any determined comparison of how many invalidity decisions are based upon "new" prior art that was, or, was not available to the Patent Office. The causes could be quite different.

Accordingly, it should be noted first that over-characterization of allegedly critical conditions are not convincing and radical treatment of a patient without complete diagnosis results in a long recovery, or invalidism. Maybe the illness has not been carefully diagnosed for legislative remedy and prognostication.

Before discussing several points, however, reform objectively appears to be desirable specifically along the following broad lines because of validity results occurring in foreign countries: (Modus of operandi will be discussed later.)

1. Increasing the prior art available to the Examiner to include what is outside that which is now available in the Patent Office files.

2. Assuring appropriate revelation to the Patent Office by potential infringers possessing pertinent outside art by applying a penalty to those who fail or refuse to help.

It could be at the present time that broad claims vs. privately-known invalidating art is more attractive to an infringer than a patent having claims of assured validity.

- a. Some precedent exists because the inventor is already being penalized by Court reprisals for concealment of pertinent prior art known to him during patent prosecution.

- b. The infringer should be penalized if significant prior art is withheld from the Patent Office when he should have presented it. This is up to both Congress and the Courts.

3. Legislatively, making the disclosure of known prior art to the Patent Office a requirement assists Courts in exacting personal estoppels if withheld prior art is critical. Such prior art could then be open to others also who did not know of existence before an issuance of the patent or a notice of infringement.

4. Publication of patent application claims deemed allowable by the Patent Office and opening the application to surveillance before issuance of the patent also assists potential infringers in their research and development plans.

5. A patent Reissue procedure for Patent Office consideration of prior art anytime patentee considers newly discovered prior art to be pertinent is desirable, but only for the purposes of narrowing the claims or for interferences.

6. Reissue application also published when allowable for the surveillance of members of the public is desirable for citation of further prior art if none was cited at the previous publication.

7. There is little reason not to assure validity for the Courts if the patent is likely to be infringed.

Corrective legislative treatment is simple. It is believed that a minor but critical corrective operation, not needed when prior art was sparse and the patent system was young, is all that is required now to satisfy the Courts, the Patent Office, the inventors, and, more important, the purpose expressed by the Constitution involving the Congressional duty to Promote Progress of Science and the Useful Arts.

If the Courts feel they are doing more and more of what should already have been accomplished by trained Patent Office personnel which is technically better equipped to pass on validity, they are right. Moreover, if they feel that somehow patent claims that come before them should have been better finalized before issuance instead of being subjected after issuance to further public prior art knowledge and strained technical interpretations to save validity and still be infringed, they are right. But more and more prior art is being brought to the attention of the Courts than the Patent Office Examiner has

available to him. The questions are to determine where it is coming from and how to get it to the Examiner.

But first, are the Courts correct in blaming the Patent Office? Senator Hart mentions 72% invalidity, whereas it was 80.89% for 1940-1944 (J.P.O.S. vol. 32, page 807). It went down to 76.58% for 1945-1949. For 1968-1972 it was 50% validity.* With no figures known, it looks like something has already been improving. What are the figures? Then, see also J.P.O.S. vol. 52, page 407, where 75% of the invalidations are traced to new art. Is this what Senator Hart meant? So, let us say the *new* art is most likely the major part of the problem, if there is one.* The critical question, however, is was the "new" art found in the Patent Office collection, or, outside the Patent Office? Is research on this impossible?

In five of the ten Circuit Courts, it appears in the J.P.O.S. vol. 32, page 807 that the percentage of invalidity was over 80% with two Circuits well into the 90's, while four others were below "72%" with one as low as 23.07%, and, these figures include also non-infringement. Maybe the 23% Circuit is approaching a solution to the problem, and, maybe a "standard of invention" is being sought to level this sawtooth curve among the Circuits.

Reconnoitering on remedies to further promote progress

It would seem that in a quest for some "standard of invention" or a remedy for the percentage of patent mortality by invalidity, such may already be at hand in the jurisprudential hierarchy of "rules, principles and standards" for judicial consistency throughout the Circuits, and, to shorten as well as reduce patent litigation. Actually, the wise forefathers provided a standard in the Constitution that would endure with impartiality against ravages of change and self-interest influences.

The U.S. Constitution provides that:

"The Congress shall have power . . . to Promote the Progress of Science and the Useful Arts, by securing for limited times to Authors and Inventors the exclusive Right to their respective writings and discoveries."
(Art. I, Sec. 8.)

This is a standard. The question for both Courts and Legislature is not "why" but "how" to better Promote the Progress of Science and the Useful Arts. This end would justify any reasonable Court consideration or Congressional means if progress will be advanced. It is a broad and enduring standard that is tried and true. Future legislation and judicial decision should measure up to this standard because they can well be measured by it.

First, what does advance progress?

(a) The Constitution also sets forth one way as a started for Congress; namely, by securing the exclusive Right to the Inventor, i.e. the true inventor, so that the inventor personally receives the credit.

In the first half century of the Constitution, however, Congress found this was a step in the right direction, but not too much "progress" was being made with the patentee having the burden of sustaining validity.

(b) In 1836 Congress enacted a provision that a patent was presumed to be valid. The infringer was shouldered with the burden of proving invalidity.

It worked. Ever since these two basic concepts were brought together, the greatest and most rapid progress has occurred for Americans that is known to our civilization of man, all in the brief period of less than five generations of the 200 generations of recorded civilization, and, the greatest compendium of Science and the Useful Arts is now found in the U.S. Patent Office and in reductions to practice, public uses and publications. More than this, Invention is still stimulated with a momentum for even greater progress industrially and for even better standards of living. Progress has been and is being promoted.

Now that golden eggs are resulting, shall we risk killing the goose? Or, shall we further nurture it? If we can, reformation is in order.

Suggestions or possible solutions indicated by the Courts should not be overlooked, but if what promotes the progress and useful arts for the people comes under criticism merely because it might be a burden to the Court, the Court would be willing to bear its burden of promoting progress. The Courts are the servants of the people as well as being people themselves.

But with this burgeoning of U.S. technology and the standards of living, a strong reaction by the Courts to hard-fought infringement actions is well-

*Patent Office Study of Court Determinations of Validity/Invalidity 1968-1972 (P.T.C.A. for September 13, 1973, page F-1).

founded. Seeing prior art being turned up before them by the alleged infringers through extensive validity searches, costing in the thousands of dollars, which the Patent Office Examiners cannot match, the Courts well may question the validity of patents being issued by the Patent Office within its budget. This is a critical question of interest.

(c) Accordingly, a further ingredient for the promotion of Progress of Science and the Useful Arts would logically be to do all that is possible to strengthen the presumption of validity. There is little else basically for concern.

How is this to be accomplished? The Patent Office cannot provide extensive searches for every patent application passing through it for examination and keep current in its work and promptness of issuance, which factors also promote progress. Nor, can the Patent Office have an inventor's foresight to select significant patents upon which to concentrate examination, and, even if it had, it could not approach litigation validity searches on all patents to cover the less than one percent of the patents which are litigated. The Patent Office simply does not possess all the prior art that can be cited by defendants.

If the Patent Office cannot do the outside searching for many reasons, then how can the holders of pertinent prior art be induced or compelled to reveal it to the Patent Office? Estoppel? Quite probably, but a Court would have difficulty in helping by "estoppel" if Congress does not lay down requirements that have to be met to avoid an estoppel.

In this direction, the applicants should not be burdened with "new" art validity searches. Their prosecution expenses are already extensive. The presumption of invalidity would be re-invoked that was corrected in 1836. Anything that unnecessarily increases the burden upon the inventor other than properly disclosing and claiming his invention, or, deprives him of exclusivity and the validity presumption, it is obviously a negative approach by previous trial and error with respect to promoting progress. Yet, an improvement of the status of validity of issued patents will promote progress.

Of course, the inventor can be induced to disclose that he knows of the prior art under threat of invalidity, etc., with penalties. (See *Brand Plastics Co. v. Dow Chemical Co.* 168 U.S.P.Q. 133, C.D. Calif. 1971 and 177 D.S.P.Q. 33 C.A.9 1973.) But the inventor doesn't know all the prior art. And the inventor having conscientiously done his best, expects the public benefited by his invention to do its best to assure the presumption of validity with a complete presentation of the pertinent prior art for examination by the Patent Office and the Public to assay the novelty and claims of a patent which might become important.

If this assurance necessarily requires further expense for the inventor, then the inventor should be rewarded some additional return as a patentee for his valid patent. Otherwise, the promotion of progress by disclosures and the granting of a patent begins to break down.

Psychologically, inventions do not just appear upon which patents can be granted. The inventor has had to make extra effort and sacrifices to improve his environment and disclose it to the public by patent or product, and seeks a reward. Unfortunately, this psychology is not comprehended by most people, including legislators, even though many will walk away from a business promotion which has nothing in it for them.

Briefly, practically everyone is an innovator. Congress innovates. An inventor is an innovator working in a field where novel innovations can be protected by statute. The psychology does exist and must be understood in order to promote progress.

An inventor thinks creatively for the ultimate benefit of the public even though most of the patentees are ranked as employed personnel. His employer then expects recompense.

Trade secrets and guilds would be very inviting comparatively if discouragement of recompense is increased, and, there is interest in this subject today.

How is the "public" going to better deliver on its part of assuring valid exclusivity? Here again are two general considerations.

It generally is only when a copier wants to capitalize on another's innovation without compensation to the innovator-inventor that validity becomes a litigation problem. Thus, the only time validity becomes serious for the Courts is when someone copies the patented subject matter thereby indicating appreciable current importance of the invention to the public, and, the patentee objects by litigation if negotiations for a license break down.

How about a pre-issuance validity assurance treatment for patents in which knowledgeable members of the public participate in helping the Patent Office? There obviously are comparatively only a few patents of all those issued that will ultimately reach the Courts. There is no need to burden all patents with a pre-issuance validity assurance treatment. However, selecting the ones which are important for pre-issuance treatment requires a preselection that only the inventors and competitors are competent to perform, and, the Patent Office should also have an option to require it, confidentially knowing of developments before it.

The first person to pass on the selection would be the inventor himself who already cites his prior art knowledge to the Patent Office. As mentioned, concealment in this quarter is already being penalized. Then, after preliminary prosecution and a tentative allowance, the inventor could have a choice, either to have the patent issue for a predetermined term, a choice for which he has no one to blame except himself, or, he can elect and pay an additional fee and have it published for public appraisal purposes. Thereby, he would appreciably reduce the expenses of universal or general publication procedure since such an election may be in the minority, yet, provide the advantages of prior art outside the Patent Office being brought, upon election, to the attention of Patent Office before issuance. If these requests increase, then the inventors are accepting a system whose expense was not forced upon them and adjustments can be made in the Patent Office with some assurance of public acceptance and improved validity results. This promotes progress.

Public relations thereon also would indicate that someone else should not inform the inventor that his effort is not a worthy invention. Let the inventor have his choice if he merely wants a patent. He may not want a patent for litigation purposes. Just issue the patent. Many competitors file competitive patents for disclosure reasons which they may not even use. This also promoted progress.

On the other hand, after electing to assure validity by public reaction, then with one more action on the merits given by the Patent Office after preissuance publication, the patent can be issued for a longer period of years dating from its filing date as some recompense for extra trouble and expense encountered by the applicant in looking to help a Court, if infringed.

A significant question, of course, is how to induce others to present to the Patent Office prior art known to them. First, who knows the prior art any better than competitors in the product being patented? If they do not know specifics, a search for additional art can be conducted by the competitors when they have the otherwise allowable claims before them. They are the most knowledgeable in the field involved, particularly if litigation appears to be likely, and they can be required by legislation to indicate to the Patent Office before the patent issues that prior art they would rely upon if they were to be sued on the published allowable claims in event they were issued as the claims of a patent. No opposition proceeding like in Germany is contemplated, just citation of the prior art, if any, for benefit of the Examiner. In other words, the *modus operandi* enable the competitors to bring the knowledgeable prior art in full focus for the Patent Office on patents which, in the opinion of the inventors and competitors, are most likely to be litigated. If an "unpublished" patent becomes infringed, a notice of infringement is followed by citation of art and a Reissue procedure. A single current disclosure by a competitor may well be worth a § 102 rejection instead of a § 103 rejection for obviousness. Accordingly, the knowledgeable experts in the industry must be legislatively induced to indicate the prior art for the experts in the Patent Office to consider while handling the prosecution of the patent before it reaches a Court.

The Courts would assist this in view of the results that: Potential litigants are making adversary contacts on prior art before a Court action is filed: the Patent Office acts upon "new" prior art while the patent is still in its formative stages; and, possibly rather than risk a failure, it is likely competitors and would-be competitors will file patents and publish articles on pertinent subject matter so that the prior art is already before the Patent Office, thus also promoting progress.

On the question of estoppels, as already mentioned, a Court may have some hesitation in applying an appropriate estoppel if a statute makes no requirements that are to be met. After that, if further prior art might appear as a defense in a Court action which should have been timely drawn to the attention of the Patent Office, the Court can apply a personal estoppel or discourage

non-citation of prior art by monetary awards against the defendant even if he wins.

If there is no prior art revealed by the competitors, as required by legislation, the Courts can then feel justified in exercising their prerogatives with estoppels and other procedural limitations of proofs. An infringement suit certainly can be expedited. In fact, if the competition cannot find pertinent art, there either is none, or, it is a lost or abandoned art such as something suppressed, a concealed reduction to practice, or report, etc.

Additionally, an early publishing of the tentatively allowable claims and disclosure is worthwhile so that the public is also informed of developments at the earliest opportunity. An earlier opportunity is provided others to design a new non-infringing product. This also promotes progress.

Such estoppels encourage possessors of prior art to disclose it to the Patent Office while it can be used at the examination level.

Reviewing the aims

The Courts and plaintiffs desire that patents issue with all the available prior art before the patent Office, particularly that which would be most likely to be cited if an action is instituted on the issued patent.

The patentee wants a valid patent for what he had to pay, and, he wants relief from infringement with the least amount of expense and greatest net recovery, including some additional advantage for choosing the assured validity-recheck publication procedure.

All the prior art of interest should pass before the patent Office before the patent issues, thereby relieving the Courts of that burdensome task.

Implementing the procedure

The procedure merely requires one optional additional step in the present prosecution of the patent application, namely:

All patent applications are prosecuted to allowability in presently routine manner. Thereupon, the Inventor-Applicant or Assignee has an option to take at his future risk the patent "as is" for a limited term, say 10, 12, or 17 years from date of publication, or, by option and paying an additional fee, elect to have it published with the allowable claims for public surveillance to enable competition to cite prior art in that particular field. Thereupon, the Patent Office reopens prosecution for one action, if need be, and the application goes to final rejection or allowance for a term of say 20 years from an appropriate date. The patentee is thus rewarded by a sounder patent and an extra length term for the extra expense he incurred. This has also made it possible for the Court to consider with greater confidence a patent prepared for litigation hazards with a full portfolio of prior art in event of trial. Thereafter, any infringer failing to cite pertinent prior art of which it was aware during the publication period is personally estopped from using that art defensively in that action. In brief, the Court takes the patent as is for the purposes of essentially determining infringement in that particular action.

Many advantages occur:

1. The inventor or the Patent Office can select an important patent application that should have outside prior art exposure before issuance.

2. The inventor or assignee is induced to publish for citation of new art by the reward of a stronger patent and an increased life in trying to be sure to have a valid one for a Court to consider if ever there is an infringement.

3. Risk of infringement and loss of defensive strength induces competitors to bring forth prior art rather than withhold it and then not be able to use it later. The Patent Office and the public are better apprised of a technological situation instead of not knowing of otherwise withheld prior art that might free other competition also, as part of the knowledge that actually should be in public domain.

4. The Patent Office is further financed by a fee for publicly rechecking validity before issuance.

5. The Courts can rule for or against evidence improperly withheld when the possessor should have revealed and did not.

6. The necessitated study of patent applications published for opposition stimulates earlier competitive search, research and investigation of developments overlooked and may be suggestive of further developments for the ultimate further progress of Science and the Useful Arts.

7. Potential litigants are brought into less strained contacts leading to determination of relative rights and future activity without courtroom antagonism.

8. Technical questions that would plague the deliberations of the Courts are not present, or, have already been decided with the expertise of the Patent Office.

Finally, many excellent articles, treatises and editorials have been written over a period of years by outstanding minds in the Judiciary and Patent Law profession regarding validity and invalidity involving U.S.C.A. § 103, often referred to as the "obviousness" section, and, a defendant having a better chance of invalidating broad claims of a patent in Court with the prior art kept secret until infringement suit is started. (J.P.O.S. vol. 52, page 433 (1970)).

The swing of the pendulum has been towards freedom-of-competition which has somehow swayed towards invalidity in close patent cases. It has not been unappreciated that it may be less expensive for a competitor to seek to invalidate an infringed patent by an all-out invalidation effort under Section 103 before taking a license rather than promote progress by a new design or redesign to another construction that avoids infringement. A product in the hand in physical form may be worth two research problems on the design board.

However, under it all, there seems to lurk in some decisions a background realization which may well swing from the freedom-of-competition touchstone towards the progress-being-promoted touchstone by the concept being recognized that two competing articles may be greater progress as compared with competitors expensively litigating on one article. A design or redesign to avoid infringement often involves improvements which would also promote progress if an infringer were forced to design and make a different products. The Courts may very well wish to encourage this. A true freedom to compete and progress is encouraged when a new or improved construction comes on the market. The Courts cannot help but see a thread of significance in a copier being forced to redesign because of infringing a validity-rechecked patent and then the infringer complaining when he is copied, thus ultimately there being three competing products for the public instead of lengthy protracted litigation.

Progress of Science and the Useful Arts would be better promoted and that is what is all about. The Courts have shown the way to further promote progress. Extend their estoppel potential.

Respectfully submitted

WATSON D. HARBAUGH.

Articles containing arguments of interest

Publication of Pending Applications (R.Y. Peters), J.P.O.S. vol. 48, page 553 (1966).

Re-examination System? (Martin Abramson), J.P.O.S. vol. 52, pages 407, 415 (1970).

LICENSING EXECUTIVES SOCIETY, INC.,
New York, N.Y., September 26, 1973.

U.S. SENATE,
Committee on the Judiciary,
Subcommittee on Patents,
Trademarks, and Copyrights,
Washington, D.C.

GENTLEMEN: We are very grateful to you for your response to our letter of September 11, 1973 informing us that the record would be kept open until September 28th.

As you know, our Society is a non-profit, professional organization having some 1500 members throughout the business world actively engaged in the interchange of technology. We, therefore, have the greatest concern for the U.S. patent system, its integrity and operation, and appreciate the opportunity to express our views on the issues of S. 1321 (Hart) which you have been considering in the recent hearings. We shall keep our comments as brief as possible.

On the question of providing a Public Counsel in the Patent Office, we recognize this as an attempt to improve the essential reliability of the Patent Office. However, the creation of an office of Public Counsel, and the staff associated with it, would require a substantial investment. Further, there probably would be conflicts and overlaps with "regular" Patent Office employees. We suggest that the funds provided to support this office of Public Counsel would be

better spent in increasing the size of the examining corp of the Patent Office. This would provide the Examiners more time to search the art, the result being more reliable patents.

With respect to adversary proceedings, we have no basic objection to this provided the proceedings occur after the allowance of the patent application. It would be a mistake to lay open non-allowed applications because of the substantial printing costs and the resultant administrative involvement which, in many cases, would be useless. We would prefer that such "adversary proceedings" be limited to permitting submission of prior art by third parties.

With respect to maintenance fees, we would oppose these unless the filing and issue fees were substantially reduced. In such case the "maintenance fee" would, in effect, be deferred fees. In any event, however, we strongly oppose such fees at the level suggested in S. 1321, because experience has taught us that many patent rights do not become valuable in the market place until many years after their issuance.

We see no net advantage in the deferred examination system suggested in S. 1321 and feel it creates more trouble than it is worth. We note that European countries which have the most experience in this area has not provided for deferred examination in the new European Patent Convention.

We support the idea of making the Patent Office an independent agency. We also support the idea of making the Commissioner of Patents at least an Assistant Secretary of Commerce if the Patent Office is to remain in that Department. It is obvious that substantial changes are necessary to improve the stability of the Patent Office management staff. Changing the Patent Office to an independent agency would accomplish this and therefore, we approve.

In addition, we strongly urge that any new patent legislation include specific guidelines specifying what the patent owner can properly do in licensing his patent rights. Indeed, we feel Congress would be derelict in its duty if it did not clarify this area of the law. To leave the validity of any particular licensing practice to the vagaries and expenses of litigation is a distinct disservice to the innovative sector of our Society.

We thank you for this opportunity to comment on this vitally important, pending legislation.

Very truly yours,

C. H. CHAPPELL, *President.*

PATENT LAW ASSOCIATION OF LOS ANGELES,
Los Angeles Calif., September 12, 1973.

HON. JOHN L. McCLELLAN,
Chairman, Subcommittee on Patents, Trademarks, and Copyrights, Committee on the Judiciary, U.S. Senate, Washington, D.C.

DEAR SENATOR McCLELLAN: The Patent Law Association of Los Angeles has been informed by your Chief Counsel, Thomas C. Brennan, Esq., under date of August 7th, that hearings will be held September 11, 13, and 14, 1973, on the Hart bill, S. 1321 (93d Congress, 1st Session). We are informed that it will not be possible to allocate time to representatives of our Association. We have, however, been urged to request our members to furnish to your subcommittee any suggestions regarding the bill's provisions, including those relating to specified issues discussed hereinafter. The comments which follow are an expression of the consensus of our Legislative Committee and of our Board of Governors, including our officers.

The patent bar has devoted thousands of man-hours since the report of the Presidential Commission in efforts to assist your subcommittee in modernizing the patent laws. We have traveled across the continent repeatedly to special meetings of our national associations which were devoted to no other purpose. Our deliberations and debates produced successive drafts of proposed legislation culminating in a draft, each and every provision of which had been carefully considered and determined to represent legislation in the public interest.

Senator Hart's bill, S. 1321, is not the result of such a deliberate process of open debate participated in by any member of the patent bar wishing to be heard on the subject. This is not to say that it lacks merit. It does, however, provide a basis for our opinion that it would be improvident to enact legislation so different from any previously proposed, without subjecting it to the same deliberation and debate.

First, therefore, we urge your subcommittee to refrain from reporting this bill until its very novel provisions have been deliberated upon and debated by those most familiar with the subject matter to which it relates—the members of the patent bar.

As to the five subjects designated as being included in the forthcoming hearings we have only the following comments at this time:

PUBLIC ADVERSARY HEARINGS

We have previously approved provisions for public assistance to patent examiners after the issuance of patents, and revocation of patents, for cause, within a limited period after their issue.

We oppose publication of all applications because it would "pollute" the fields of search with large numbers of redundant publications and more than double the expenses of publication incurred by the Patent Office.

Further consideration is necessary of the provision for participation by third parties in the prosecution of published applications. It is questionable whether the prospective enhancement of the validity of issued patents so effected would justify the additional costs imposed upon individual applicants by such procedures.

PUBLIC COUNSEL

Insofar as the contemplated duties of the proposed Public Counsel are no more than those presently discharged by the Solicitor of the Patent Office or members of the examining corps, their mere transfer is unobjectionable.

The extremely broad subpoena powers of the proposed Public Counsel which would be conferred by Section 24 of the bill are, however, entirely unprecedented, and such provisions should not be approved, if at all, without full deliberation and open debate by the patent bar.

DEFERRED EXAMINATION

This proposal has been fully considered and rejected by the organized patent bar after full deliberation and open debate.

The experience of foreign countries which have implemented deferred examination practices has since demonstrated that any supposed advantages of deferred examination are more than offset by the "pollution" of the fields of search by redundant publications.

Furthermore, the advances made in recent years by our Patent Office in reducing its backlog have entirely removed the originally envisioned need for deferred examination.

Therefore, we oppose these provisions.

FEE SCHEDULE AND MAINTENANCE FEES

We oppose any schedule of fees designed to recover 60 to 75 percent of the costs of operation of the Patent Office for the reason that such a fee schedule inevitably would impose prohibitive financial burdens on individual inventors and small businesses, thereby inhibiting innovation. Also, such a fee schedule would make the Patent Office a profit-making federal operation when it should not have such function. The profit-making aspect of the Patent Office operation would come about because the government not only receives fees from patent applicants, but also obtains taxes which are levied on royalties and transfers of patents. The latter revenue would not be received by the federal government at all if it were not for the operations of the Patent Office, and so should be credited against the cost of operation of the Patent Office before the subject of Patent Office fees is considered.

Provisions for maintenance fees have previously been considered and rejected by the patent bar because of the severe penalty such fees would impose upon individual inventors and small businesses. Such fees would tend to stifle invention and encourage secrecy, thereby running counter to the Constitutional goal of promoting the progress of the useful arts. The exculpatory provisions of Sections 41(b) and (c) might lessen such burdens, but would not eliminate them so that the net negative effect would remain. The sections also would substantially increase the work load of the Patent Office. The proposed maintenance fee of at least \$1,000 per year potentially would generate enor-

mous amounts of revenue, entirely disproportionate to the cost of operating the Patent Office.

INDEPENDENT AGENCY

We unqualifiedly approve the proposal to make the Patent Office an independent agency.

Its integration into the Department of Commerce, which resulted from a recommendation of the Hoover Commission, was "an experiment noble in purpose", as Mr. Hoover once characterized the 18th Amendment, but it was no more successful than the latter. It is time to revert the status of the Patent Office to that of an independent agency, and we applaud Senator Hart's proposal to that end.

Very truly yours,

RICHARD F. CARR, *President.*

MACHINERY AND ALLIED PRODUCTS INSTITUTE,
Washington, D.C., October 1, 1973.

Senator JOHN L. McCLELLAN,
Chairman, Subcommittee on Patents, Trademarks, and Copyrights, Committee on The Judiciary, U.S. Senate, Washington, D.C.

DEAR CHAIRMAN McCLELLAN: The Machinery and Allied Products Institute appreciates the opportunity to offer its views on S. 1321, "For the general reform and revision of the Patent Laws. . . ." ¹ The membership of the Institute is comprised of capital goods and allied industrial product manufacturers. These are high technology industries and, as such, have a very deep interest in the American patent system and in proposals for changing that system. It is our understanding that, although the public hearings on S. 1321, which were recently concluded, were devoted to the consideration of only five "... important new issues" raised by this proposal, written statements may consider all aspects of the bill, and accordingly our statement discusses ten of its provisions. However, before considering separately these several sections of S. 1321 we should like to put our specific comments in a broader perspective by commenting briefly on the general thrust and the broader possibilities of this bill.

GENERAL COMMENTS

The spirit of S. 1321 emerges in Section 1 thereof, "National Patent Policy," by a subtle but substantial alteration of the constitutional provision from which it derives. Article I, Section 8 of the Constitution asserts that the Congress shall have the power "To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." (Underscoring supplied.) The constitutional word "right" is changed to "privilege" in Section 1 of S. 1321. By implication an applicant for letters patent who seeks to have secured to him the right to which the disclosure of his discovery entitles him now becomes a supplicant who desires of his government not a declaration of his rights but the award of a special privilege. The author of this proposed change may not have intended the significance which we attach to it but, regardless of intent, it seems to us a precursor of other and unquestionably significant changes in our patent laws which, in our judgment, would tend in the long run greatly to reduce the usefulness of a patent system which has served this country well.

We believe that any number of changes, discussed in more specific terms below, would tend to discourage the use of the patent system which is to say that the inventor of new art would decline publicly to disclose such new art but rather would conceal it and attempt to profit from his discovery by maintaining it as a trade secret. Although the Institute would oppose at any time legislation harmful to the patent system—and we think S. 1321 would be harmful—this bill is especially untimely during a period when the United States is losing much of the technological lead which it has for so many years enjoyed.

¹ As this letter is filed, the White House has announced the submission to Congress of "The Patent Modernization and Reform Act of 1973." No copy of the bill is yet available and, hence, no comment on it is offered here.

SPECIFIC COMMENTS

Our specific comments on certain provisions of S. 1321 appear below:

Section 3(d), Public Counsel.—This section of the proposal would provide for creation of a "Public Counsel," independent of the Commissioner, who would be empowered to intervene in, participate in, and review virtually all Patent Office proceedings and appeals. Section 24 of the bill would arm him with the power of subpoena. This new office and the extraordinary grant of authority to it are designed, in the language of the proposed statute, "... [to] assure . . . that high quality patents which meet the statutory and constitutional criteria therefore issue from the Patent Office."

We oppose this proposal. If the function of "Public Counsel" is to represent the public interest, then this new office would in large measure simply duplicate the function of the patent examiner—and the solicitor—whose responsibility is, and always has been, to represent the public interest.

It would seem inevitable that the Office of Public Counsel, in order to discharge its broad mandate, would necessarily require a corps of competent engineer/attorneys to retrace ground already covered by the Patent Office staff. Aside from additional cost thus involved, the actions of the Public Counsel could only serve further to delay action on patent applications and thus to aggravate a condition cited by Senator Hart as one of the reasons for "reforms" proposed in S. 1321.

We think the Public Counsel's choices of cases for intervention or review—out of the 100,000 applications filed and the 70,000 patents granted annually—would have to be a largely, if not wholly, subjective judgment since there appears no logical or objective basis for making such judgments. And the very broad powers to be confided in the Public Counsel, if unreasonably or arbitrarily exercised, could obstruct Patent Office business and tend to be destructive of the patent system.

As for "high quality patents" they are the primary responsibility of the Commissioner. Yet this proposal would make the Public Counsel responsible for achievement of the same goal. It seems scarcely necessary to argue the undesirability of splitting such a fundamental responsibility with its almost inevitably divisive effects on the organizational structure of the patent system.

Section 41—Patent Office fees

In general, this section of the bill calls for a fee structure "... designed to effect an overall recovery in the range of 65 to 75 percentum of the costs of operation of the Patent Office. . . ." In seeking attainment of this general standard, and subject to certain fee exemptions "... to benefit and encourage individual investors and small businessmen," this proviso says that "Beginning the fourth year after a patent issues, the maintenance fee thereon shall be no less than \$1,000, and shall increase annually by at least 25 percentum each year. . . ."

If we understand the proposal, the minimum maintenance fees for a single patent with a twelve year life from date of filing would aggregate a little more than \$15,000. Minimum maintenance fees under the proposed schedule for one patent with a 17-year life from date of filing would amount to more than \$54,000. If the suggestion of a 20-year patent life from date of filing were adopted, and this has been frequently suggested, the minimum maintenance fees for a single patent over that period would amount to almost \$110,000. An illustration of minimum annual fees, under the proposed schedule with totals aggregated for each of these three periods, appears in Attachment I to this statement. This fee schedule approaches confiscation.

Aside from these exorbitant figures, there is the question of whether or not it is desirable to establish a precise statutory formula for the recovery of patent office costs through maintenance fees. Congress reviews the Patent Office annually and appropriates funds for its operation. This, it seems to us, is the proper function of Congress and would appear to be much more appropriate than setting the Patent Office up in business for itself. Moreover, the detailed specification of a maintenance fee formula appears to be a radical departure from similar statutory provisions. For example, even the Tennessee Valley Authority, which has a product to sell, is not required to recoup a fixed percentage of its costs of operations. Rather the pertinent statute merely states that power is to be sold in such a way as to assist in liquidating the cost of the project. The payment of exorbitant maintenance fees alters the basic philosophy of the system by requiring the patentee to pay tribute for

continuance of the limited monopoly right—now to be deemed a “privilege”—which a patent confers.

It is, of course, not a novel proposal and is apparently patterned on graduated systems of maintenance fees common to foreign patent systems. This has been a source of irritation to Americans holding foreign patents and the proposal to equalize this burden on foreigners holding U.S. patents is appealing in that respect. One must also acknowledge that the proposal is at least plausible insofar as it would encourage the “working” of patents and permitting useless ones to lapse. But there are better ways to achieve that end. However, frankly, we doubt if recoupment of the operating costs of the Patent Office is the real intent of this proposal. Rather, we think, its purpose may be to “encourage discouragement”—that is, to persuade patentees to discontinue maintenance of patents already in existence. Maintenance fee costs of the proportions suggested above are very likely to produce that result—and, in our opinion, to the serious long term detriment of the United States notwithstanding those merits of the proposal acknowledged above. In part, this is because it takes time to exploit a patent, an exploitation that is more important to society than to the inventor since his success depends upon the usefulness and the broad public acceptance of the thing he has created.

The more significant and the more dangerous aspect of this proposal's adoption would be unseen. Almost surely it would tend to reduce—and probably drastically—the flow of patent applications. New technology, including scientific and engineering advances of basic character, would be concealed from public view in the form of trade secrets rather than being disclosed to the world as the grant of a patent right requires. We should not lose sight of the fact that at least two great public interests are served by the grant of letters patent. In addition to the public benefits deriving from exploitation of the exclusive right of practice provided by the patent, the products of the requirement of disclosure are both a source of instruction and finite developments which permit others to further refine, develop and build upon them. To sum up, the imposition of maintenance fees at the level contemplated by S. 1321 will not only serve greatly to diminish the incentive to patent but will tend seriously to choke off the very useful public disclosure of new technology which our patent system is designed to produce.

A lesser—but nonetheless important—adverse result of the proposed maintenance fee schedule is the likelihood that companies will not even undertake development programs on items which, although promising in the longer run, offer no expectation of early commercialization. At the best, the new technology involved will be delayed; at the worst, it will be lost and perhaps to foreign competitors.

Section 101—Subject matter patentable

As in the case of substituting a “privilege” for a “right” in Section 1, noted above this section of S. 1321 would substitute for the present statutory affirmation that “A person shall be entitled to a patent unless . . .” the negative declaration that “A person shall not be entitled to a patent if . . .” (Underscoring supplied.) This change may mean little or much but at least it would seem to place the burden of all persuasion on the applicant and replace language well settled by custom and usage by language that may constitute an invitation to extend the long continued judicial assault on the patent system. We strongly recommend against this sort of unexplained change in language; if some change of substance is intended the Committee's intent should be clarified in the legislative record.

Further significant changes in language are sprinkled through the several subsections of Section 101. By setting up new bars to the grant of a patent based on foreign knowledge or use, public use and sale as well as “other tangible form” provisions would tend very substantially to increase the amount of prior art to be searched, found and considered. Expense would be correspondingly increased in significant amount.

Section 112—Specification

Subsection (a) of this provision of S. 1321 proposes adoption of a requirement for an enormously expanded disclosure requirement. The cost of preparing patent applications would of course be commensurately increased. We shall comment on only one aspect of this expansion—the requirement for disclosure of “. . . all know-how known to the inventor and applicant necessary or commercially requisite to make, use, and work the same.”

This requirement evidently contemplates full disclosure of knowhow constituting valuable trade secrets. We have no doubt that many, if not most, applicants who confronted this costly—and perhaps competitively disastrous—possibility would choose secrecy rather than exposure. That is to say the patentable invention would not be patented but treated as a trade secret with a further restriction on use of the patent system and, of course, a corresponding reduction in public disclosure of new technology. Adoption of the requirements of this section, in conjunction with certain other provisions of S. 1321 with which this statement is concerned, would tend, in our judgment, substantially to destroy the patent system as we have known it. We strongly oppose any such disclosure requirement.

Section 115—Oath of invention

Statutory language relating to the oath of invention would be substantially enlarged by S. 1321. We are concerned particularly by the language of subsection (a) (2) which prescribes the oath to be executed by the applicant, who is not an inventor, but is "a corporation or other business entity." To begin with, this oath, to be executed "after notice of allowance," is purely supplemental and would seem to add little to the oath required of the inventor at the time of filing. That aside, a more important question is raised as to the metes and bounds of this expanded requirement. If the oath finally prescribed merely recites that the affiant believes himself to be the most knowledgeable in the applicant organization concerning the facts to be set forth in the oath and that he does not speak for each and every employee or agent of the organization but makes the oath solely upon his personal knowledge, then there would seem to be no great difficulty. If, on the other hand, the affiant is expected to speak through his oath for each individual employee or agent of the entity, then the provision would be unrealistic and unadministrable and made more so by the size of corporations required to so affirm and by the mobility of personnel involved in research and development activities.

Section 315—Examination or reexamination and Section 137—Participation of parties

Our discussion here engages two sections of S. 1321 inasmuch as both are directly concerned with the bill's intent of providing for public adversary proceedings and, taken together, authorize the initiation of opposition by anyone between the period of public availability (Section 122) and allowances. Such opposition may be either ex parte or inter partes at the opposer's election (Section 135(d) and 137) and he may, if he chooses, remain anonymous (Section 137(d)).

We acknowledge that such opposition may, in some cases, strengthen the presumption of a patent's validity. But at what cost? Assuming the vigorous exercise of rights of opposition contemplated by these two sections—and this, we think is a reasonable assumption—there could not fail to be substantial and costly delays in patent issuance, the avoidance of which is one of the express purposes of S. 1321.

In addition to the question of cost there is a manifest potential for frivolous, meddlesome and harrassing opposition. There is also the potential for opponents to significantly delay the issuance of a patent with complete impunity, and whether successful or not, to reduce the applicant's period of protection. Indeed, we are told that this is fairly common practice in some foreign jurisdictions. To the extent that this occurs, S. 1321 will have introduced one more disincentive to use of the patent system and with all of those detrimental consequences of that result already described.

Probably the most serious objection to these provisions of S. 1321—when considered with the public availability requirement of Section 122—is its fundamental unfairness to the applicant. Under present law, even though an application for a patent is filed, the applicant may at any time prior to allowance elect not to go forward with the application and still maintain the secrecy of the invention as a trade secret. Publication to the world under Section 122—an essential first step in the process of public adversary proceedings here sought—would destroy this right. Again, the disinclination to file for a patent is strengthened.

If it is the judgment of the Subcommittee that some provision for adversary proceedings is necessary to strengthen the presumption of validity, then we believe the relevant sections of S. 1321 should be changed to provide:

1. There should be no publication of applications prior to allowance.

2. Opposition should be permitted after allowance only as an inter partes proceeding, or the opposer should be permitted to appeal (with provision for a hearing) from a finding by the Patent Examiner of patentability notwithstanding the material submitted by the opposer.

3. The opposer shall not be permitted to remain anonymous.

Section 153—Contents and term of patent

This section of S. 1321 provides that: "The term of a patent shall expire twelve years from the actual filing date in the United States or, if a prior filing date under Section 119 of this title has been claimed, twelve years from such date. . ." with the further proviso that the term may be extended by any period of time consumed by deferred examination under Chapter 18 of the bill. This is to be contrasted with provisions of present law which call for a term of seventeen years from date of issue—not the date of filing.

It is the opinion of experienced corporate patent counsel that, generally speaking, twelve years is too short a period of time in which to allow for recovery of research and development expenses and to earn a reasonable return on the total investment involved. In fact, seventeen years may be too short a period in some cases to commercialize inventions which may require extensive adaptation in order to achieve public acceptance.

As in the case of other provisions already discussed, the reduction of the patent term to twelve years from date of application could not fail, in our judgment, to weaken the patent system and destroy its benefits by causing inventors to withhold their discoveries from the public and profit on them, if at all, as trade secrets.

We observe that dating a patent's term from the date of filing makes the applicant dependent on expeditious governmental processing and indeed punishes him for delays over which he has no control. Moreover, as we have noted, certain provisions of S. 1321 would tend to increase such delays. However, if Congress considers it necessary to accept the date of filing concept, we suggest that the term be made not less than twenty years.

Section 263—Rights of employee-inventors guaranteed

By the terms of S. 1321—

Subject to other provisions of Federal law, no direct or indirect assignment by an inventor to his employer, or to a person designated thereby, of the subject matter of an application for patent or patent, developed in the course of his employment, shall be valid unless the employer agrees to pay the employee, in addition to his regular salary or compensation for services, a minimum of 2 per centum of the profit or savings to the employer, attributable to such subject matter.

From any of at least three angles from which this provision should be considered—employment policy, national patent policy and practicality of administration—this is a very bad provision and should be rejected. Let us consider briefly each of the three aspects of the matter identified above.

Employment policy.—To begin with, one may assume that the corporation which hires employee-inventors must compete for their services with compensation and benefits at least equal to what is demanded by the very lively market in which such talents are traded. Moreover, substantially all such employees are hired to invent and make no contribution beyond what they are paid for—the employer provides the environment for inventor, materials and equipment, all costs and bears the risks of development and commercial exploitation. Yet this is but a small part of the employment policy issues raised by this proposal.

Clearly, this requirement would discriminate against employees who make significant contributions to a patented invention but which contributions are not of the character acquired to entitle the contributor to the status of co-inventor and thus to share in the rewards. It would also discriminate against those who make indispensable innovative contributions in reducing a patented invention to commercial practice and in market development. And, of course, it discriminates against all those other employees whose work although essential, is not connected with the process of invention and patenting. The inevitable product of such discrimination would be employee dissatisfaction, jealousy, a loss of cooperation where cooperation is essential to success, and controversy between employees and between employee and employer. In pointing to these obvious discriminations that would result from the 2 percent proposal we do not mean to suggest, either directly or by implication, that we favor the con-

cept—indeed we strongly oppose it—or that its reach should be extended to take in other classes of employees.

In addition, this proposal raises a potential conflict of interest for the employee-inventor who is in a position to control or influence the design of a product. Usually, there are several alternatives in design available to the engineer or designer. If one such alternative is covered by a patent held by the employee-inventor, he may be induced to choose or recommend adoption of that alternative even though another would produce a superior product. The potentialities of this conflict of interest extend beyond the employment relationship to the marketplace. The economic incentive for the employee-inventor to choose his patented alternative may result in the consumer receiving a less desirable product and less value for his dollar. This aspect of the proposal is clearly contrary to the public interest.

National patent policy.—The employment effects of this proposal alone—jealousy, controversy, the disruption of research and development team efforts, to name a few—would cause many employers to discontinue their present use of the patent system. Obviously, it would increase the ultimate cost of production and because of the manufacturer's uncertainty as to the market's acceptance of a higher price there is still a further disinclination to patent. To the extent, of course, that additional costs resulting from this policy could be passed on to consumers in the form of higher prices they would be—and should be.

One obvious effect of such a policy—in some cases at least—would be to give imports a 2 percent advantage over domestically manufactured products based on patents.

Except where the 2 percent override—however figured—can be passed on to government as a contract cost (and one fails to see how government could hold such costs to be unallowable), the adoption of this policy would almost certainly result in a lesser number of patent applications. (One result could be a lessening of company-sponsored R&D and an increase in independent development and design companies with patent rights passing under contracts between them and the companies who employ them.) From the standpoint of national policy a reduction in patent applications and a corresponding increase in trade secrets—and the trade-off here could be very significant—would be most unfortunate. To repeat again, the point cannot be emphasized too strongly, a policy which tends to reduce disclosure and promote secrecy would be most harmful to the national interest.

Administration.—For reasons already suggested, we think the policy embodied in this provision is most unwise and should be abandoned. Even if that were not true, the provision as presently drafted is unworkable. In brief, it says in effect that the employee-inventor is to receive, “. . . in addition to his regular salary or compensation for services, a minimum of 2 per centum of the profit or savings to the employer, attributable to such subject matter.”

Let us consider only a few of the possibilities presented. Suppose the product is unprofitable. There being no profit base to which the statutory percentage can be applied, one assumes that no payment would be required. But assume that there is a profit as determined in accordance with “generally accepted accounting principles,” there would arise immediately the question of which of the whole range of such principles now available were employed in calculation of the profit and one foresees unending controversy over the correctness of cost allocations, overhead calculations and so on.

But let us assume that these preliminary hurdles can be overcome and go to the really difficult problems. “The Commissioner shall by regulation establish procedures and methods, including accounting procedures, for carrying out the provisions of this section.” Suppose that the invention is a joint invention and that letters patent identify not one but two or more co-inventors. Is each co-inventor entitled to “. . . 2 per centum of the profit or savings to the employer”? Or, if not, how is the payment to be divided—equally, or in accordance with the relative merits of the contributions of the several co-inventors?

Most troublesome of all, we think, would be the invention which relates to a small part of a larger product or process and which may embody in its construction or operation a number of patents. How is the manufacturer to go about attributing profit to each of the patented inventions involved in order to arrive at the several bases to which the 2 percent figure is to be applied? Where the invention relates, for example, to one step in a manufacturing process incorporating a variety of patented know-how, the calculation of savings attributable to this one part of the process would be equally difficult.

To sum up, we think that proposal to "guarantee" the rights of employee-inventors is unjustified, unwise and unworkable.

In introducing S. 1321, Senator Hart declared "... the evidence is strong that our system tends to frustrate invention and tie up technology so the public cannot benefit from it."² Without accepting the accuracy of this statement—and we don't—one may accept it as a general conclusion underlying the introduction of the bill. It seems fair to inquire if the adoption of S. 1321 would provide new incentives for invention and free technology for the benefit of the public?

We believe, for all the reasons set out above, that enactment of S. 1321 would have exactly the opposite result. In our judgment, it would substantially—perhaps drastically—reduce the volume of applications for patent and thus "tie up" new technology by causing it to die stillborn or to be concealed in the form of trade secrets. With the disclosure of new technology thus reduced—and disclosure is the stick to the patent incentive carrot—the great bubbling ferment of technological experimentation and advance, which has depended so much upon disclosure required by the patent system and which has been so great an element of national strength, will take on a placid and a sterile aspect.

This concludes our statement of S. 1321 and again we desire to express our appreciation for the opportunity of presenting our views on this most important measure. If the Subcommittee or its staff should have any questions concerning our statement or require additional information on those matters dealt with herein, please do not hesitate to call upon us.

Respectfully,

CHARLES W. STEWART, *President*.

ATTACHMENT I.—*Minimum Maintenance Fees for a Patent Under Section 41 of S. 1321 for a 12-Year Term, a 17-Year Term and a 20-Year Term*

Assume January 5, 1973 is date of filing application with maintenance fees calculated from that date; the maintenance fees on an annual basis and on a total basis for 12-year, 17-year, and 20-year terms would be as follows:

1973	Average period of patent pendency—no fees.	
1974		
1975		
1976		
1977	-----	\$100. 00
1978	-----	1, 000. 00
1979	-----	1, 250. 00
1980	-----	1, 562. 50
1981	-----	1, 953. 13
1982	-----	2, 441. 41
1983	-----	3, 051. 76
1984	-----	3, 814. 70
Subtotal (12-year total) -----		15, 173. 50
1985	-----	4, 768. 36
1986	-----	5, 960. 48
1987	-----	7, 450. 60
1988	-----	9, 313. 25
1989	-----	11, 641. 56
Subtotal (17-year total) -----		54, 307. 75
1990	-----	14, 551. 95
1991	-----	18, 189. 94
1992	-----	22, 737. 43
20-year total -----		109, 787. 07

² *Congressional Record*, March 22, 1973, p. S. 5378.

MANUFACTURING CHEMISTS ASSOCIATION,
Washington, D.C., September 26, 1973.

Hon. JOHN L. McCLELLAN,

Chairman, Subcommittee on Patents, Trademarks and Copyrights, Committee on the Judiciary U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: In the Congressional Record of July 31, 1973, you announced that the Subcommittee on Patents, Trademarks, and Copyrights of the Senate Judiciary Committee had decided to reopen the hearings on the general revision of the patent law for the purpose of receiving testimony on various important new issues, such as are contained in S. 1321. Your announcement indicated that the hearings were to be scheduled on September 11, 13, and 14 and invited parties interested in testifying at these hearings to contact the Subcommittee office. Your office further indicated that the hearings would include coverage of five specific subjects.

The Manufacturing Chemists Association is a non-profit trade association of 170 United States company members representing more than 90% of the production capacity of basic industrial chemicals within this country. The members of this Association recognize the importance of a viable patent system to our industry and the economy of the United States and wish to lend their best efforts to produce changes which, they believe, will provide the United States with a more effective patent system. In view of the importance to the chemical industry of the issues to be considered by your Subcommittee at these hearings, this Association would, under normal circumstances, actively welcome and request an opportunity to be heard. We understand, however, that the demands for time to testify on the part of those interested already exceed the allowed scheduled time. To avoid overburdening your Subcommittee and, at the same time, assist the Subcommittee in moving to a prompt consideration of the proposed changes, we waive the opportunity to testify orally at the hearings and submit herewith, instead, our comments in writing, which we request be included in the record of hearings.

The following comments are directed to the specific subjects mentioned in your announcement, as it is our understanding that your Subcommittee intends to limit its consideration to these subjects at this time.

MODIFICATION OF PATENT EXAMINATION PROCEEDINGS TO PROVIDE PUBLIC
ADVERSARY HEARINGS

MCA Position.—MCA favors adversary proceedings which would be available to the public only after allowance of a pending patent application, provided the adversary proceeding does not impair the effective and enforceable life of the patent.

The proposal to provide public adversary proceedings within the patent system is believed to make available means by which patent quality can be substantially improved. Many patent systems of the world now provide for adversary proceedings. The experience of our members with such systems has been mixed. However, we believe the concept meritorious in that it will assist the Patent Office in its examination burden and should, hopefully, strengthen the presumption of validity insofar as "novelty" requirements are concerned. Having on hand the benefit of prior art supplied by third persons should also make the Patent Office "103 determination" more complete insofar as "the skill of the art" is concerned.

THE CREATION OF THE OFFICE OF PUBLIC COUNSEL

MCA Position.—MCA opposes creation of an Office of Public Counsel as defined in Sections 3(d) and 24 of S. 1321. The proposed adversary procedures will ensure higher quality patents, thus making the Office of Public Counsel unnecessary. Moreover, the concept as proposed would introduce substantial problems in Patent Office operations.

The proposal in S. 1321 (Sections 3(d) and 24) to establish the Office of Public Counsel was apparently triggered by the desire to have within the patent system a means to ensure "high quality patents which meet the statutory and constitutional criteria. . ." It is the view of MCA that an "adversary procedure" effectively structured will ensure quality patents issuing in the normal

course. If this occurs, it would obviate the necessity for the Office of Public Counsel.

The latter, as currently defined in Section 3(d), duplicates in part the current function of the Office of the Solicitor. Perhaps of more concern, however, is the apparent creation within the Patent Office of a "second" Patent Office. There seems to be no limit on the responsibilities of the "Public Counsel" with respect to prosecution and the unlimited actions left to his initiative under Section 3(d)(4). We believe that the creation of the Office of Public Counsel would be disruptive of the normal administrative functioning of the Patent Office and would be without redeeming virtue.

ESTABLISHMENT OF A SYSTEM FOR DEFERRED EXAMINATION OF PATENT APPLICATIONS

MCA Position.—MCA favors establishment of a system of deferred examination, provided that there is no publication of pending patent applications until at least 18 months after filing, and then publication of only those pending applications for which no examination has been requested. Where examination is requested by an application, publication should follow allowance.

MCA is aware of worldwide trends toward deferred examination systems. We understand that the experience and success of other nations with such systems has been mixed. Nevertheless, we are in favor of the establishment of such a system if the examination burden of the Patent Office can be reduced and the net savings in time, effort, and money applied elsewhere in the system to meet the desired objective of the issuance of more valid, enforceable patents.

We believe, however, that there should be no publication of pending patent applications until at least 18 months after filing so that premature disclosure of research work does not occur. The public policies of many foreign patent systems are hinged to the 18th month after first filing. A U.S. deferred examination system, operating on an 18 month publication after filing, would be consistent with other systems and allow a period of time for an inventor to further develop his invention without untimely disclosure to competitors. Moreover, we believe that if an applicant has requested examination, publication of his pending application should be withheld until allowance.

In this regard, therefore, MCA would be opposed to the publication provisions as now set forth in Section 122 of S. 1321.

REVISION OF THE PATENT FEE SCHEDULE, INCLUDING THE ESTABLISHMENT OF MAINTENANCE FEES

MCA Position.—MCA has no objection to the establishment of maintenance fees which, together with other Patent Office income, are sufficient to support the Patent Office examining operation, provided that such fees are maintained at reasonable and non-discriminatory levels, do not discourage patent application filings and are not confiscatory of patent property. MCA opposes Section 41 of S. 1321 as not meeting these criteria.

The subject of patent maintenance fees is one which has arisen many times in past consideration of Patent Law revision and should be thought of in the broader context as to what is the purpose of the "fee program". If it is the intent of Congress that the fee schedule should provide over-all recovery of the cost of the operation of the Patent Office—and MCA does not view this as desirable—maintenance fee levels, together with other proposed fees, will necessarily toll the demise of the independent inventor. Surely, this is not the objective of any Patent Law revision. Before an effective level of fees can be established, it would appear to us that basic consideration has to be given to what costs of operation of the Patent Office are to be recovered from the fee structure. Any structure of fees, including maintenance fees, should, thereafter be set so as not to discourage patent application filings or be confiscatory of patent property.

ADMINISTRATIVE RESTRUCTURING OF THE PATENT OFFICE, INCLUDING THE PROPOSED ESTABLISHMENT OF THE PATENT OFFICE AS AN INDEPENDENT AGENCY

MCA Position.—MCA does not favor making the Patent Office an independent agency, but does favor making the Commissioner of Patents an Assistant Secretary of Commerce, reporting directly to the Secretary of Commerce.

We believe that with proper recognition, enlightened administration, and reasonable policies, the Patent Office can be made a most effective operating unit. We believe this can best be accomplished within the Department of Commerce organizational structure by raising the level and prestige of the Office of Commissioner of Patents to that of an Assistant Secretary of Commerce. As Assistant Secretary of Commerce for Patents, reporting directly to the Secretary of Commerce, the Commissioner should be more effective and responsive in directing the programs, policies, and administration of the Patent Office.

While we have limited our comments to the five specific subjects mentioned in your announcement concerning the patent law revision hearings, there are many other sections of S. 1321 that are of serious concern to the Manufacturing Chemists Association. We respectfully request, therefore, that this Association, as well as other interested parties, be afforded the opportunity to comment on the other provisions of S. 1321 before your Subcommittee completes action on this measure.

In closing, we wish to commend your Subcommittee for its diligence in striving to provide constructive reform of the Patent Law of the United States. We offer you our continuing assistance in seeking the mutual objective of structuring a Patent Law which will ensure a high level of research and development activity, an increased inventive productivity, and appropriate reward for the same. Such results will be of immeasurable benefit to the social and economic position of the United States as we enter a future of increasing world competition in the fields of technology and scientific progress.

Sincerely,

W. J. DRIVER.

REPORT FROM THE MICHIGAN STATE BAR

The following is the majority report of the Committee on Anti-Trust and Patent Law of the Patent Law Section of the Michigan State Bar as approved by the Section Council. It does not, in any way, represent the opinion or position of the Michigan State Bar.

It was the unanimous opinion of the Committee that the U.S. Patent System is in fundamental difficulty and that the problems confronting it require basic changes to make it a productive part of the United States Economic System. It was also concluded that the U.S. Patent System today has largely ceased to function as a means of encouraging individual inventors and small companies. However, it was also concluded that S. 1321 does not offer any viable solutions to the problems, rather it would compound them.

The basic concept of patents is to encourage inventors to publicly disclose their ideas in return for a limited period during which they can recover compensation for their contribution. It is a very important objective of the patent system to serve and encourage both the individual inventor and the small company. The present system has already become so expensive and the patent's value so questionable as to discourage individual inventors and many small companies. S. 1321 will materially increase these costs and for all practical purposes make patents the exclusive province of the very large economic enterprise.

While there are numerous features of S. 1321 which are considered to be objectionable because of cost or being unrealistic from a practical point of view, the following points were given particular consideration:

I. OPPOSITION

The principle of introducing an Opposition Proceeding into the U.S. Patent System is considered desirable but the procedures set out in S. 1321 are considered to be too expensive and too complex. To be practical and effective, the Opposition Proceeding should not occur until after the application is allowed, should be limited in time, conducted without the costly and time consuming discovery procedures used in Federal Court Practice, provide for disclosure of the name of the Opposer and the evidence produced during the Opposition should be judged by someone, preferably a board, other than the Examiner in charge of the application.

II. PUBLIC COUNSEL

This feature of S. 1321 is objected to because it is much too costly and is considered unworkable. In view of the quantity and complexity of present day

technology, the Public Counsel could not be effective without a supporting staff at least as great as the present examining corps of the Patent Office. The cost both to the Patent Office and to the Applicant would be enormous.

Further, the introduction of discover procedures and the addition of third party practice to the examination procedure would interfere with orderly examination, consume the Examiner's time with procedural matters and make the examination prohibitively expensive for the Applicant. It would make patents a luxury that only the large and wealthy economic enterprise would afford.

It was the consensus of the Committee that the Public Counsel would either become an ineffective office or would so complicate the functions of the patent Office as to bring its operations to a standstill.

III. MAINTENANCE FEES

The proposed schedule of Maintenance Fees would effectively deny the benefits of the Patent system to individuals and small companies. Only the large economic enterprise could afford them. The proposed procedures by which individuals and small companies could obtain temporary relief from them are so complicated and costly as to make them economically impractical. The proposed fee schedule would be an additional factor contributing to the growth and economic power concentration of large companies and economic combinations.

IV. COMPULSORY ROYALTY TO INVENTOR BY ASSIGNEE—EMPLOYER

Except in the situation in which the patent is licensed to a third party and earns royalties which can be readily identified, this proposal is considered unworkable. It is not believed possible to identify the contribution of most patented inventions where the invention is used by the employer solely within the employer's own operations. The accounting problems are very difficult and, in any case, would be very expensive and subject to controversy. The proposal is considered impractical and likely to discourage adoption of improvements in products and processes. Alternatively, to avoid exposure to complicated accounting problems, it is believed likely that many employers would feel forced to adopt the improvement without patenting anything and, wherever possible, protect it by secrecy. This would defeat the public disclosure purpose of the patent law. The cost and complexity of the proposed patent examination procedure would effectively deny the employee an opportunity to patent the idea at his own expense.

It was the Committee's opinion that the difficulties of the present patent system largely do not arise out of the present patent law but rather out of its implementation. The patent system would be better served by an improved examination system, coupled with an effective opposition procedure and a revision of the judicial system under which patents are litigated to introduce greater uniformity into the subjective standards by which they are finally adjudicated.

PREPARED MATERIAL SUBMITTED BY THE MILWAUKEE PATENT LAW ASSOCIATION

The Milwaukee Patent Law Association at a regular meeting of its members held on September 11, 1973, after having given due consideration to Senate Bill S.1321, upon recommendations of its Committee on Legislation, passed the following Resolutions and approved the supporting memoranda relating thereto:

RESOLUTION NO. 1

(Modification of patent examination proceedings to provide public adversary hearings)

BE IT RESOLVED: That the Milwaukee Patent Law Association hereby goes on record as opposing the provisions of Senate Bill S.1321 permitting wide range third party adversary participation in patent application examination, interference and appellate procedures, for the reasons that:

(1) They will markedly increase the costs and burdens on applicants in obtaining patents.

(2) They could discourage independent inventors of limited means from using the patent system.

(3) They will afford opportunity for delaying and obstructionist tactics by third parties with selfish interests, and

(4) They will complicate the Patent Office administration, and unduly prolong the issuance of patents.

That the Milwaukee Patent Law Association is not opposed, in principle, to some form of public participation in the patent application examining process to enhance the quality of issued patents. However, it believes that to be practical and workable, it should be limited to:

(a) A definite time period during or after completion of the Patent Office's examination of an applicant's claims, and

(b) The public's right to cite patents, documents, or other tangible evidence that may be relevant to the claimed subject matter as regards the conditions and requirements of Secs. 102 and 103 of Title 35 USC.

RESOLUTION NO. 2

(The creation of the Office of Public Counsel)

BE IT RESOLVED: That the Milwaukee Patent Law Association is opposed to the creation of the Office of Public Counsel as envisioned in S.1321 for the reasons that:

(1) The Public Counsel would be required to represent potentially conflicting interests;

(2) The Public Counsel would be an unnecessary intervenor in existing forms of adversary proceedings; and

(3) The establishment of the Office of Public Counsel would lead to the creation of an overlapping bureaucracy in the Patent Office.

Supporting memorandum

As defined by S.1321, the Public Counsel would have at least three potentially conflicting responsibilities. First, he would be responsible for prosecuting and defending appeals from any final action of the Patent Office (Sec. 3(d)(2), Sec. 134(a); Sec. 143; Sec. 145). In this role the Public Counsel would function much as the present Solicitor who is charged to act as the Commissioner's lawyer, except that, contrary to present practice, the Public Counsel would represent the Primary Examiner in appeals before the Board of Appeals. In his second role, the Public Counsel is charged to be the advocate of the public interest to assure a high quality patent system, and to represent the public need to analyze or defend an important, new or developing theory of law, or involving an important, new or developing area of technology. (Sec. 3(d)(1)). The third role is that of investigator and public prosecutor granted by Sec. 3(d)(4) which gives the Public Counsel a roving commission, to participate in all proceedings and conduct investigations or inquiries.

It appears on the face of S.1321 that the roles envisioned for the Public Counsel will require him to represent potentially conflicting interests. In his role as the defender of the final action of the Patent Office, the public counsel must necessarily be representing the examining corps and the Commissioner to uphold the correctness of their decisions. What, however, of the instance in which the Public Counsel believes that the decision which he is called upon is not in the public interests. It is as reasonable to assume that the Public Counsel would decide that the public interest is contrary to the position of the Patent Office as it is to assume that he will decide that the public interest coincides with the position of the Patent Office. If the underlying rationale in S.1321 is that the public interest will always coincide with a Patent Office decision, then there is no need for an advocate of the public interest apart from the Commissioner of Patents and the examining corps.

One of the stated purposes for the establishment of the Public Counsel is to insure high quality patents through an adversary process. If an adversary process is more likely to insure high quality patents, there would be no additional benefit to inserting a third party advocate in those proceedings in which adversary interests are already represented, such as in the normal suit for

patent infringement. Yet, the Public Counsel is given the right to intervene in private infringement actions (Sec. 24; Sec. 3(d)(4)). This seems an unnecessary burden to the present adversary system. It could only result in greater costs in patent litigation which already is an extremely expensive proceeding. Adversary procedures within the Patent Office can be established without creating a need for the Public Counsel.

The Public Counsel, presumably in his role as advocate of the public interest and in his role as public prosecutor, is assigned the duty of considering and reviewing all proceedings in the Patent Office (Sec. 3(d)). He may be called in at any stage by the Primary Examiner (Sec. 132(a)), and he has the right as a "party" to inform the Commissioner of relevant prior art. It is our belief that it would be necessary for the Public Counsel to have his own examining staff to conduct searches for relevant prior art and to review the work product of the existing Examining Corps if he were to hope to carry out these duties. It is strongly urged that this would amount to the creation of a bureaucracy within the Patent Office which would, in large part, parallel and overlap the existing functions of the Patent Office itself.

Because of the inherent conflicting roles designed for the Public Counsel, because of the potentiality for the Public Counsel to insert his office into existing adversary proceedings, and because of the potentiality for the creation of a bureaucracy within the Patent Office to duplicate and oversee the performance of duties which are to be carried out under statutory command by other staff of the Patent Office, we are opposed to the creation of the Office of Public Counsel.

If, as has always been assumed, it is the duty of the Commissioner of Patents to insure to the extent possible that high quality patents issue from the Patent Office, it is unnecessary to create a separate office to perform that function. If the Commissioner of Patents has been unable to insure the issuance of high quality patents it is not seen how it is possible that the mere addition of an Assistant Commissioner of Patents will improve the track record.

RESOLUTION NO. 3

(Establishment of a system for deferred examination of patent applications)

BE IT RESOLVED: That the Milwaukee Patent Law Association considers implementation of a deferred examination system as proposed in S.1321 to be premature and therefore, opposes at this time the deferred examination system proposed in said Bill; and further, that the Milwaukee Patent Law Association urges modification of the publication of Section 122, S.1321 in order to be consistent with publication requirements of foreign patent systems and proposed international patent schemes; and further, that the Milwaukee Patent Law Association urges modification of the term in Section 153, S.1321 to be twenty years without exception.

Supporting memorandum

Consideration of the proposed deferred examination of patent applications as proposed in S.1321 inherently involves consideration of the proposals in that Bill for publication and term of the patent.

While the Milwaukee Patent Law Association does not oppose the concept of a deferred examination system, it seems wise to take advantage of information and experience for such a proposal before its implementation. Such information and experience can best come from countries who have recently adopted a deferred examination system—but there has been insufficient time to permit proper evaluation of these systems. Hence, the objection to the deferred examination system.

S.1321 suggests publication six months after filing of the application. Especially because the recently revised patent systems of the world and proposed international patent systems would call for later publication, generally eighteen months after filing, it seems only prudent to adopt a publication time table which is consistent with other patent systems of the world.

S.1321 proposes a term of twelve years for the patent with provisions to extend that term for any deferral for examination or secrecy. Rather than provide for such extension of the term for specific fact situations which inherently involve certain discrimination and motivations inconsistent with the patent system, it is urged that a fixed term of twenty years from the date of filing be adopted.

RESOLUTION NO. 4

(Revision of the patent fee schedule, including the establishment of maintenance fees)

BE IT RESOLVED:

That the Milwaukee Patent Law Association is opposed to the establishment of a system of fees for the maintenance of U.S. patents on the grounds that they will create a substantial additional burden on the owners of patents and thus tend to discourage the making of inventions, the publication of the same through the patent system, and their ultimate utilization.

FURTHER RESOLVED: That this Association disapproves the maintenance fee provisions of Senate Bill S.1321, 93rd Congress, First Session, and particularly Section 41 thereof.

Supporting memorandum

Section 41 of S.1321 would revise the patent fee schedule to include annual maintenance fees of not to exceed \$100 for the first three years, and thereafter of not less than \$1,000 per year increased by 25% each year for the life of the patent. Up to 80% of these fees may be exempted to benefit and encourage individual inventors and small businessmen. The revenue derived would be used to defray the cost of running the Patent Office and should result in lower filing and other fee charged by the Patent Office.

On its face, the proposition is appealing because only the valuable patents would be maintained and their owners could well afford to pay the fees. Poor patents would be dropped and would no longer clutter up the records. The greatest burden of fees would only fall after the patents had proved themselves successful rather than when applications are filed.

The basic proposition is not novel since most foreign countries have a graduated system of maintenance fees. This has irritated the U.S. owners of foreign patents, because the foreign owners of U.S. patents have no such burden.

The principal objection to such fees is the inordinate amount of time and expense in making intelligent decisions whether or not to maintain patents having unrealized potential. This can well exceed the amount of the fees. Serious mistakes can be made in dropping patents prior to an opportunity to exploit them.

The Bill cleverly proposes relief for the individual inventor and small businessman. It submitted this provision can give rise to more detriment in the form of abuse, improper favors and administrative expense (both to the Government and the inventor) than the evil it is designed to cure. The management of patents in a large corporation has become so decentralized that the segments involved, including the recent concept of venture managers of various research activities, is not much different than the individual inventor. While the corporation has the money to pay such fees, they simply add to the burden of financing research operations and will discourage the type of activity the patent system is intended to promote.

Under the Paris Convention, it is believed that the relief granted individual inventors and small businessmen would have to apply to foreign as well as U.S. nationals. Since many communistic countries issue most of their patents (or inventor certificates) to individuals, our Government would obtain very little revenue from corresponding patents obtained in the U.S.A.

The proponents of the Bill may argue the purpose is not to increase the burden but to shift the burden because of the accompanying reduction in filing fees. If this was the only effect, it is still detrimental because it will encourage the filing on marginal inventions, thus adding to the problems of the Patent Office, and will tend to lower the quality and reliability of U.S. patents.

Experience has shown that new forms of taxation, while designed to relieve the burden in some other area, usually result in simply adding another burden. In this instance, the administration of the plan will add substantial cost to everyone concerned.

It should be pointed out that most foreign countries have either (1) no examination system of any consequence, or (2) such a system of examination that once granted, patents have a far greater presumption of validity. In either case, payment of annual fees may be justified as proper revenue producers for what the inventor is getting under their systems. It might be argued that a patent which has borne substantial maintenance fees should be better

treated than one that hasn't, but this 'smacks' of paying for the patent privilege rather than having the patent judged on its merit.

The fee schedule proposed in S.1321 would involve a cost of nearly \$20,000 to obtain and maintain a patent for its present 17-year life, assuming there was no deferred examination. For a company that obtained an average of 20 patents a year, the annual cost to maintain all such patents would be over \$200,000. While the Bill also proposed to reduce the term of patents to 12 years, the fact that this would reduce the total fees by about one-half is small solace for the loss of patent rights involved. It is hard to conceive of any measure which would do more to discourage the making of inventions.

For the reasons discussed, it is believed that a patent maintenance fee program is undesirable.

RESOLUTION NO. 5

(Administrative restructuring of the Patent Office, including the proposed establishment of the Patent Office as an independent agency)

BE IT RESOLVED: That the Milwaukee Patent Law Association adopts the following Statement of Position with respect to those provisions of S.1321 that relate to or touch upon the administrative restructuring of the Patent Office, including the proposed establishment of the Patent Office as an independent agency.

Supporting memorandum

Establishment of Patent Office as an Independent Agency.—The Milwaukee Patent Law Association, believing that Sec. 2 of S.1321 cannot, in and of itself, either contribute to or detract from attainment of the expressed objective "to assure that United States patents are of high quality and reliable," takes no position on that specific proposal but recommends careful study of it with respect to such considerations as:

The status of Patent Office officials vis a vis their counterparts in foreign countries, having in mind the increasing importance and magnitude of international patent operations;

Adequacy of liaison with Congress and with other Federal administrative agencies;

Duplication of personnel and functions; and

Availability to the Patent Office of expertise for the solution of administrative problems.

Availability to the Patent Office of expertise for the solution of administration.—The Milwaukee Patent Law Association opposes those provisions of S.1321 that would freeze, in statutory form, administrative practices which are now within the Commissioner's regulatory and discretionary powers and which therefore can now be readily changed to accommodate changing conditions. As specific examples:

Sec. 6(d) would mandate the Commissioner to maintain public search facilities "in various (unspecified) parts of the United States." Such facilities would be costly if complete and of doubtful utility if incomplete; but the Commissioner would have no discretion to discontinue all of them if their cost proved disproportionate to benefits from them.

Sec. 6(e) would mandate the Commissioner to further the improvement of information retrieval facilities without requiring a cost/benefit appraisal. Such development, coupled with such appraisal, is now inherent in the Commissioner's administrative authority.

Sec. 8(e) re-enacts an administrative detail that has been dropped from the earlier patent laws by the Patent Codification Act of 1952—

Imposition upon Commissioner of Burden of Fixing Fees Now prescribed by Statute.—The Milwaukee Patent Law Association opposes the principle of S.1321 insofar as it imposes upon the Commissioner the burden of fixing Patent Office filing, examination and maintenance fees and requires that such fees be calculated to recover a specified proportion of costs of Patent Office operations. Allowing the Commissioner to determine both the income and the expenditures of the Patent Office, without external supervision would be unwholesome. Whether fees are fixed from within the Patent Office or from outside it, the administrative problems of fee fixing under the proposed criteria would be complicated by the difficulty of predicting the income that would be realized from any particular fee schedule, owing to provisions in the bill

for discretionary exceptions to such fee schedule and for steeply graduated maintenance fee percentage increments. Furthermore, the need for changing the fee schedule from time to time, to accommodate changing Patent Office expenditures and fee receipts, would give rise to confusion in calculating, collecting and accounting for fees in particular cases.

Administrative Burdens Imposed by Substantive Provisions.—The Milwaukee Patent Law Association opposes certain substantive provisions of S.1321 for the reason that they would impose administrative burdens upon the Patent Office that would not "assure that United States patents are of high quality and reliable." For example:

Sec. 112, in its several provisions requiring a complete exposition of the prior art, and particularly in its subsec. (d) (1), would require the examiner to ascertain whether the applicant had in fact set forth all that was known and conventional; and even assuming that the section is intended to require such disclosure only as to known and conventional art that is *relevant* (a qualification that does not appear in the section), the examiner would be required, in effect, to spend time on matters which, by their very nature, made no contribution to the advancement of the useful arts.

Sec. 122 and certain related provisions with respect to early disclosure may compromise national security by permitting inventions relating to advanced military equipment to be inadvertently published before sufficient time has passed for adequate evaluation by the defense agencies. The two month period for such evaluation provided for in Sec. 181(b) is unrealistically short. Even with a longer period, the need for expeditious handling of patent applications containing such subject matter would be disruptive to Patent Office routine.

Sec. 132(c), in requiring that "all decisions by a primary examiner" be accompanied by the equivalent of a judicial opinion, would materially increase the work load upon the Examining corps (thus increasing an already overwhelming backlog) without achieving any offsetting gain to the public or patentees.

THE MILWAUKEE PATENT LAW ASSOCIATION APPROVED:

ARNOLD J. ERICSEN
President.

I certify that the foregoing resolution was adopted by a unanimous vote of the members of the Milwaukee Patent Law Association at a regular announced meeting of the members of the association with a quorum of members present held on September 11, 1973.

BARRY E. SAMMONS,
*Secretary, The Milwaukee
Patent Law Association.*

3M Co.
Saint Paul, Minn., September 27, 1973.

The Honorable JOHN L. McCLELLAN,
*Chairman, Senate Judiciary Committee,
U.S. Senate,
Washington, D.C.*

DEAR SENATOR: We are concerned with several aspects of S. 1321, the bill to reform and revise the Patent Laws, Title 35 U.S. Code.

In introducing a similar bill (H.R. 7111) in the House in April of this year, Congressman Wayne Owens quoted with approval from the President's technology message to Congress in March, calling "a 'strong and reliable patent system' an important predicate to U.S. technological progress and industrial strength". He also stated it to be an objective of the act "to restore confidence in the patent system by increasing and strengthening the quality and reliability of the U.S. patent grant". We agree with both of these propositions. But how they may best be attained is quite another question.

In this country we have never had opposition proceedings against the grant of a patent which are common in various other countries, e.g., the United Kingdom and West Germany. While we have had a limited provision for receiving protests to the grant of a patent and limited public use proceedings (Rules 291 and 292 of the Rules of Practice of the U.S. Patent Office), yet there has been no provision for publishing the application or laying it open to

public inspection prior to grant. It was only when one received legitimate knowledge of the pendency of an application (as in a priority contest or interference in the Patent Office or in a contract negotiation) that he was in a position to file a protest or initiate a public use proceeding.

We believe this country should come to some proceeding where applications for patents, if allowed, are then published and laid open to public inspection, to invite protests or oppositions; or, alternatively, a patent could issue forthwith the public could be given a period of time, e.g., six months to lodge nullity proceedings, following which the claims might be revised or recast, much as is now done in reissue patents.

You will note that we do not propose that the public be allowed to participate in the examination process until claims have been allowed, viz., the Examiner finds the application in condition for allowance.

Former Commissioner of Patents Robert Gottschalk, as a first step in a procedure to increase the quality and reliability of patents, recommended a change in the Rules of Practice to provide for voluntary proceedings to permit protests to the grant of patents. That is, an applicant would be given the opportunity to open his application to public inspection prior to the issuance of a patent, to allow competitors or other members of the public the opportunity to protest the grant of a patent and to cite prior art, publications, etc., believed to have been overlooked by the Patent Office. Proposed changes in the Rules to implement this proposal were published in the Official Gazette of the U.S. Patent Office on June 19, 1973, by order of the Commissioner of Patents, with the approval of the Assistant Secretary of Commerce for Science and Technology. A hearing is scheduled in the Patent Office on this proposed rule change on October 31, 1973.

This innovation in the practice, if actually promulgated, would offer a revealing proving ground. In his address to the American Patent Law Association meeting in Saint Paul on May 10, 1973, Commissioner Gottschalk said:

"It is our hope that the experience gained with this practice may well be the forerunner of legislation along the same general lines; . . . [but applicable] to all applications."

The Hart bill, S. 1321 (and likewise the Owens bill, H.R. 7111) contains such a drastic proposal for increasing the quality and reliability of patents as to defeat its stated objective.

Sections 122 and 135 of the Hart bill would provide for laying an application open to public inspection and copying (unless it was vital to national security under Sec. 181) promptly after it is filed and "prior to the date of first examination". That is, before there was any decision by the Examiner that any patent should issue or, if so, what scope of claims the applicant was entitled to in the Examiner's opinion, the applicant could be burdened with premature and perhaps wholly unnecessary protests. Additionally, the fact that a competitor could immediately get access to an application—whereas today applications are maintained in confidence (Sec. 122 of 35 U.S. Code)—would dissuade many inventors from filing a patent application or otherwise publicizing their inventions.

Laying open to public inspection eighteen months after filing is the earliest exposure of an application to the public in any major industrial nation, e.g., Germany, France, the Scandinavian countries, etc.; and the *quid pro quo* for that disclosure is the vesting of certain rights in the applicant. In the United Kingdom there is no laying open until acceptance, i.e., 2½ years or more after filing.

So we are very much opposed to Sections 122 and 135 of the Hart bill, S. 1321.

The Hart bill also proposes the new office of "Public Counsel": see Sections 3(d), 24, 132(a), 134(a), 142, etc. The Public Counsel could "intervene and participate at any time in any Patent Office proceeding" and would be "independent of the Commissioner" [Section 3(d)(1)]. It would be the Public Counsel's duty to assure that only "high quality patents . . . issue from the Patent Office" and "To that end he shall consider and review all proceedings in the Patent Office" (Sec. 3d). Section 3(d) also indicates that he would have "delegates". His delegates would necessarily be very numerous if he followed the aforesaid mandate. Indeed, the office of Public Counsel might rival the size of the present Examining Corps of the Patent Office; and, if the office of Public Counsel did what the bill provides, there would in effect be a separate examining corps in that office. And what reason would we have to assume that they

would be more competent than the present Examining Corps? Or what needed function would that office serve which is not now served by the Solicitor's office and the Supervisory Examiners.

No patent office of any major industrial nation has a second tier of examination such as that proposed for the office of Public Counsel.

We are opposed to the Public Counsel proposal. We consider it unwieldy, unworkable and grossly expensive. If protest proceedings are inaugurated, starting with the Gottschalk proposal, this should offer a preferable and more economical approach to the problem.

If S. 1321 is revised to take care of the points discussed, we will be glad also to lend any assistance we can on other aspects of the bill.

Very truly yours,

HARRY HELTZER,

Chairman and Chief Executive Officer.

cc: Members of Senate Judiciary Committee

MORTON, BERNARD, BROWN, ROBERTS & SUTHERLAND,
1054 THIRTY-FIRST STREET, NORTHWEST
Washington, D.C., September 13, 1973.

Re Patent Reform Legislation

HON. JOHN D. MCCLELLAN,
*Chairman, Subcommittee on Patents,
Trademarks, and Copyrights,
Committee on the Judiciary,
U.S. Senate,
Washington, D.C.*

DEAR SENATOR MCCLELLAN: I understand that written comment pertinent to S.1321 is welcome if submitted before the end of this month. My credentials as a commentator on patent law reform are active private practice in all phases of intellectual property law since 1938 in New York to 1958 and in Washington since (1941-1946, U.S. Army excepted), and teaching a course in intellectual property law at the School of Law of the University of Virginia since 1959.

My crystallized comment is embodied in a complete draft of a patent statute, a copy of which I attach. This proposal borrows heavily from S.1321, but it reflects my earnest conviction that the Framers of the Constitution were right. By that I mean that effectively securing exclusive rights to discoveries for the benefit of their inventors for limited times really does promote the progress of the useful arts.

To accomplish this Constitutional policy, my proposal concentrates on providing a strengthened examination system to ensure that the disclosure of every United States patent includes a patentable discovery while at the same time simplifying formalities and encouraging inventors to get into the system.

The principal "strengthening" device I propose is conferring upon parties to a patent application, including the applicant and the examiner initially, and the public after allowability has been provisionally determined, a subpoena power utilizing Rule 31 of the Federal Rules of Civil Procedure. This device was selected to prevent otherwise desirable adversary proceedings in the Patent Office from becoming a weapon in the hands of the owners of the deepest purse. It also assures that subpoenas will be supervised by the District Courts and the abuse of witnesses readily prevented by experienced local judges. Additionally, I would enlarge the role of the Solicitor of the Patent Office to make him the examiner's advocate in subpoena matters and in both administrative and court appellate proceedings. You will find support for the basics of my proposal in a recent article "Proposal for Modifying the Administrative Procedure of the Patent Office to Improve Patent Validity" by Roland T. Bryan, 1 APLA Quarterly Journal, No. 3 (Summer, 1973) 193-201.

The principal "simplifying" devices I propose are abolition of interferences in favor of first-to-file a system including provision for simple preliminary disclosure and a one-year moratorium on inventor-derived prior art and a functional definition of prior art.

The principal "encouraging" devices I propose are deferred examination and low initial fees, with revenue being made up by maintenance fees on a moderate scale.

I believe that adoption of my proposal, as compared with S.1321 would result in:

- (1) more patent applications filed;
- (2) a higher percentage of validity of the patents issued; and
- (3) substantially lower costs to inventors in Patent Office and attorney fees, especially per application, but also per issued patent.

In addition to reforms in the Patent granting process, I also propose to define patent infringement in its relation to patent claims and to correct certain deficiencies of U.S. patent law in the protection it affords U.S. patent owners against "foreign" activities which create profits for U.S. exploiters of their discoveries.

Many other details have had to be dovetailed into foregoing basic reforms and many minor modernizations and ameliorations have been effected. When the S.1321 hearings have been completed, this record added to the very exhaustive records of prior hearing on patent reform already held under your chairmanship, your sub-committee will, I have every reason to believe, be in possession of all the guidance it could need to use my draft in aid of its task of producing a "committee print".

Respectfully,

W. BROWN MORTON, JR.

Enclosure.

A BILL

For the promotion of the progress of the useful arts by the general revision of the Patent Laws, title 35 of the United States Code, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, in accordance with the authority granted, and in furtherance of the policy adopted, by article 1, section 8, clause 8 of the United States Constitution, title 35 of the United States Code, entitled "Patents," is hereby amended in its entirety to read as follows:

"TITLE 35—PATENTS

"Part	Sec.
"I. PATENT OFFICE -----	1
"II. PATENTABILITY OF INVENTIONS AND GRANT OF PATENTS -----	100
"III. PATENTS AND INFRINGEMENTS OF PATENTS -----	261

"PART I—PATENT OFFICE

"Chapter	Sec.
"1. Establishment, Officers, Functions -----	1
"2. Proceedings in the Patent Office -----	21
"3. Practice Before the Patent Office -----	31
"4. Patent Office Fees -----	41

"CHAPTER 1.—ESTABLISHMENT, OFFICERS, FUNCTIONS

"Sec.

- "1. National Patent Policy.
- "2. Establishment and seal.
- "3. Commissioner and other officers.
- "4. Restriction on officers and employees as to interest in patents.
- "5. Board of Appeals.
- "6. Library, classification of patents, public search facilities.
- "7. Certified copies of records.
- "8. Publications.
- "9. Advisory Council on the Patent System.
- "10. Annual report to Congress.

"§1. National Patent Policy

"It is hereby recognized and declared that it is the constitutionally-established policy of the United States that the progress of the useful arts is promoted by granting to inventors or their assigns for a limited time the exclusive right to those discoveries of the inventors which are new and useful and publicly disclosed, all as provided by the succeeding provisions of this title. The rights so granted are to be exercised as property rights according to law.

"§2. Establishment and Seal

"The Patent Office shall be an independent agency, where records, books, drawings, specifications, and other papers and things pertaining to patents and to trademark registrations shall be kept and preserved, except as otherwise provided by law. The Patent Office shall have a seal with which letters patent, certificates of trademark registrations, and papers issued from the Office shall be authenticated.

"§3. Commissioner and other officers

"(a) A Commissioner of Patents shall be appointed by the President, by and with the advice and consent of the Senate, and he shall be compensated at the rate now or hereafter provided for level IV of the Executive Schedule pay rates (5 U.S.C. 5315). The Commissioner shall superintend or perform all duties required by law respecting the granting and issuing of patents and the registration of trademarks, and he shall have charge of property belonging to the Patent Office. The Commissioner is authorized to promulgate rules and regulations as may be necessary or proper for purposes of his office.

"(b) There shall be a Deputy Commissioner of Patents, who shall be appointed by the President, by and with the advice and consent of the Senate, and who shall be compensated at the rate now or hereafter provided for level V of the Executive Schedule pay rates (5 U.S.C. 5316). The Deputy Commissioner shall perform such functions as the Commissioner may assign or delegate and he shall act as Commissioner during the absence or disability of the Commissioner or in the event of a vacancy in the office of Commissioner.

"(c) There shall be no more than three Assistant Commissioners of Patents, who shall be appointed by the Commissioner and who shall be compensated at a per annum rate of basic compensation fixed by him not in excess of the maximum scheduled rate provided for positions in grade 18 of the General Schedule (5 U.S.C. 5104). Such Assistant Commissioners shall perform such functions as the Commissioner may from time to time assign or delegate. In the event of vacancies in the offices of Commissioner and Deputy Commissioner, or their absence or disability, the Assistant Commissioner senior in date of appointment shall fill the office of Commissioner until said vacancies, absences, or disabilities terminate.

"(d) There shall in addition be a Solicitor of the Patent Office who shall be appointed by the President, by and with the advice and consent of the Senate, and he shall be compensated at the rate now or hereafter provided for level V of the Executive Schedule pay rates (5 U.S.C. 5316). The Solicitor shall be general counsel of the Patent Office and the advocate responsible for the presentation of the Patent Office position in all adversary proceedings provided for by his title, and he or his delegates:

"(1) shall prosecute or defend appeals from any final action of the Patent Office; and

"(2) shall take such action, participate in such other proceedings, and conduct such other investigations or inquiries, as may be necessary or appropriate to carry out the purposes of this title.

"(e) The Commissioner shall, subject to other requirements of law, appoint other officers and employees of the Patent Office, assign or delegate to them the functions of the Office, and fix the per annum rate of basic compensation therefor.

"§4. Restrictions on officers and employees as to interest in patents

"Officers and employees of the Patent Office shall be ineligible during the period of their appointments and for one year thereafter, to be named as an inventor in a patent application, to apply for a patent, and to acquire, directly or indirectly, except by inheritance or bequest, any patent or any right or interest in any patent, issued or to be issued by the Office. In patents applied for thereafter they shall not be entitled to any priority date earlier than one year after the termination of their appointment.

"§5. Board of Appeals

"(a) There shall be in the Office not to exceed twenty-four examiners-in-chief, who shall be appointed under the competitive service, in the manner prescribed for Administrative Law Judges (5 U.S.C. 3105, 5362, 7521). The per annum rate of basic compensation of each examiner-in-chief shall be fixed at not in excess of the maximum scheduled rate provided for positions in grade 17 of the General Schedule (5 U.S.C. 5104).

"(b) The examiners-in-chief shall constitute a Board of Appeals in the Patent Office. The examiners-in-chief shall be persons of competent legal knowledge and scientific ability, who will perform and exercise the judicial functions of the Office.

"(c) The Board of Appeals shall:

"(1) Hear all appeals pursuant to section 138 of this title;

"(2) Conduct all proceedings pursuant to section 182 of this title; and

"(3) Perform the functions specified as being performed by a Board of Patent Interferences in Public Law 593, Eighty-second Congress (ch. 950, 66 Stat. 792, Section 1), and other Acts of Congress and when performing such functions shall constitute a Board of Patent Interferences.

"(d) Each appeal or other action shall be determined by a panel of at least three members of the Board of Appeals, except as otherwise provided in subsection (e) of this section. The panel shall be designated for each case by the examiner-in-chief senior in date of appointment, consistent with the provisions of section 3105, of title 5, United States Code. The Board of Appeals has sole power to grant rehearings.

"(e) Whenever the Commissioner considers it necessary to maintain the work of the Board of Appeals current, he may designate any patent examiner of the primary examiner grade or higher having the requisite ability, to serve as acting examiner in chief for periods not exceeding six months each. An examiner so designated shall be qualified to act as a member of the Board of Appeals. Not more than one acting examiner in chief shall be a member of the panel of the Board of Appeals hearing any appeal or considering any case. The Commissioner is authorized to fix the per annum rate of basic compensation of each acting examiner in chief in the Patent Office at not in excess of the maximum scheduled rate provided for positions in grade 16 of the General Schedule (5 U.S.C. 5104). The per annum rate of basic compensation of each acting examiner in chief shall be adjusted, at the close of the period for which he was designated to act as examiner in chief, to the per annum rate of basic compensation which he would have been receiving at the close of such period of such designation had not been made.

"§6. *Library, classification of patents, public search facilities*

"(a) The Commissioner shall maintain a complete and current library of patents and scientific and other works and periodicals both foreign and domestic, in the Patent Office which shall be available to its employees in the discharge of their duties under this title and to assist the public in the study of the useful arts.

"(b) The Commissioner shall maintain with appropriate revisions a current publicly available classification and index by subject matter of United States patents and published United States patent applications and of such patents and published applications, and other works and periodicals, foreign and domestic, as may be necessary for the purpose of determining with readiness and accuracy the patentability of subject matter for which applications for patent are filed.

"(c) The Commissioner shall maintain facilities, in various parts of the United States, for the searching of prior art and patent materials, both foreign and domestic. To the maximum extent feasible, such prior art and patent materials, shall be complete and current, drawing upon all relevant scientific, technological, and other works and periodicals, both foreign and domestic, available, to any Government agency. The Commissioner shall have such prior art and patent materials classified and indexed according to the classification of patents.

"(d) To the maximum extent feasible, the Commissioner shall mechanize, or otherwise facilitate by electrical, mechanical, or other appropriate means, the search of such prior art and patent materials. The Commissioner shall conduct an on-going program of research and development to keep the handling, classification, storage, and retrieval of such prior art and patent material current and up to the state of the art.

"§7. *Certified copies of records*

"The Commissioner shall, upon payment of the prescribed fee, furnish certified copies of records of the Patent Office within thirty days to persons entitled thereto.

"§8. Publications

"(a) The Commissioner shall cause to be published in a timely fashion in such format as he determines to be suitable, the following:

"(1) the specifications and drawings of patents, and patent applications, subject to the provisions of this title;

"(2) certificates of trademark registrations, including statements and drawings;

"(3) all current decisions of the Patent Office Board of Appeals and the Trademark Trial and Appeal Board;

"(4) current classification manuals and indices of the classifications of patents.

"(5) The Official Gazette of the United States Patent Office;

"(b) The Commissioner shall cause to be published from time to time, in such format as he determines to be suitable, the following:

"(1) Patent abstracts;

"(2) Annual indices of patents, published applications, and trademarks and information concerning the same;

"(3) Pamphlet copies of the patent laws and rules of practice, laws and rules relating to trademarks, and circulars or other publications relating to the business of the Office.

"(c) The Commissioner may exchange any of the publications specified in subsections (a) and (b) of this section for publications desirable for the use of the Patent Office, and furnish copies of any of these publications to international intergovernmental organizations of which the United States is a member.

"(d) The Commissioner may supply copies of specifications and drawings of patents to public libraries in the United States which shall maintain such copies for the use of the public, at the rate for each year's issue prescribed by the Commissioner in accordance with section 41 (a) of this title.

"(e) The Commissioner may establish a public information service for the dissemination to the public of information concerning patents and trademarks, and may from time to time disseminate or provide for dissemination of information, the publication of which in his judgment would promote the progress of the useful arts. Such dissemination may be made by periodical or other publications, the preparation and display of exhibits, and other appropriate means.

"§ 9. Advisory Council on the Patent System

"(a) There shall be an Advisory Council on the Patent System (referred to in this section as the "Council") of not less than twelve or more than twenty-four members to be appointed by the President, by and with the advice and consent of the Senate, from the general public, without regard to the civil service laws, and to consist of persons having experience with, and representative of, the various interests most directly affected by the patent system. The President shall designate the Chairman of the Council and set the terms of the members.

"(b) It shall be the duty of the Council, on a continuing basis, to evaluate the effectiveness of the patent system in serving the public interest; to analyze the contemporary conditions and needs of the patent system; to study and appraise the methods and operations of the United States Patent Office including the quality of United States patents; and to report to the Commissioner its conclusions and recommendations.

"(c) The Commissioner shall furnish to the Council an executive secretary and such professional, secretarial, clerical, and other services and facilities as are necessary to the conduct of its business.

"§10. Annual report to Congress

"The Commissioner shall report to Congress annually the money received and expended, statistics concerning the work of the Office, an evaluation of court decisions related to the validity and enforcement of patents, and other information relating to the Office as may be useful to the Congress.

"CHAPTER 2.—PROCEEDINGS IN THE PATENT OFFICE

"Sec.

"21. Day for taking action falling on Saturday, Sunday, or holiday.

"22. Form of papers filed.

"23. Testimony in Patent Office cases; subpoenas, commissions, letters rogatory; witnesses.

"24. Oath and declaration in lieu of oath.

"25. Effect of defective execution.

"26. Filing by mail.

"§21. *Day for taking action falling on Saturday, Sunday, or holiday*

"When the day, or the last day, for taking any action or paying any fee in the United States Patent Office, or as otherwise provided in this title, falls Saturday, Sunday, a holiday within the District of Columbia, or on any day the Patent Office is closed for the receipt of papers, the action may be taken, or the fee paid, on the next succeeding secular or business day.

"§22. *Form of papers filed*

"The Commissioner may by regulation prescribe the form of papers filed in the Patent Office.

"§23. *Testimony in Patent Office cases; subpoenas, commissions, letters rogatory; witnesses*

"(a) The Commissioner may establish rules, not inconsistent with the Federal Rules of Civil Procedure and the provisions of this title, for taking depositions required in cases in the Patent Office. Any officer authorized by law to take depositions to be used in the courts of the United States, or of the State where he resides, may take such depositions.

"(b) (1) The clerk of any United States court for the district wherein a deposition is to be taken for use in any matter pending in the Patent Office, shall, upon the application of the Commissioner or the Solicitor or any other person party thereto, issue a subpoena for any witness residing or being within such district, commanding him to appear and testify before an officer in such district authorized to take depositions, at the time and place stated in the subpoena. The provisions of the Federal Rules of Civil Procedure relating to depositions and subpoenas for the attendance of witnesses and the production of documents and things shall apply to contested cases in the Patent Office.

"(2) Every witness subpoenaed and in attendance shall be allowed the fees and traveling expenses allowed to witnesses attending the United States district courts.

"(3) A judge of a court whose clerk issued a subpoena may enforce obedience to the process or punish disobedience as in other like cases, on proof that a witness, served with such subpoena, neglected or refused to appear or to testify or to produce documents and things as directed. No witness shall be deemed guilty of contempt for disobeying such subpoena unless his fees and traveling expenses in going to, and returning from, and one day's attendance at the place of examination, are paid or tendered him at the time of the service of the subpoena; nor for refusing to disclose any secret matter except upon appropriate order of the court which issued the subpoena.

"(c) The United States District Court for the District of Columbia shall, at the request of the Commissioner, issue such commission or letters rogatory pursuant to rule 28(b) of the Federal Rules of Civil Procedure as may be appropriate in carrying out the provisions of Section 134 of this title.

"(d) The deposition of a witness appearing voluntarily on proper notice may be taken without subpoena or commission or letters rogatory.

"(e) The admissibility of evidence in cases in the Patent Office shall be determined in accordance with the rules of evidence in force at the time in the United States District Court for the District of Columbia.

"§24. *Oath and declaration in lieu of oath*

"(a) An oath to be filed in the Patent Office may be made before any person within the United States authorized to administer oaths, or before any officer authorized to administer oaths in the foreign country in which the affiant may be, whose authority shall be proved by certificate of a diplomatic or consular officer of the United States, and such oath shall be valid if it complies with the laws of the State or country where made.

"(b) The Commissioner may by regulation prescribe that any document to be filed in the Patent Office and which is required by any law or regulation to be under oath may be subscribed to by a written declaration in such form as the Commissioner may prescribe, such declaration to be in lieu of the oath otherwise required.

"(c) Whenever such written declaration is used, the document must warn the declarant that willful false statements and the like are subject to punishment including fine or imprisonment, or both, citing title 18, United States Code, Section 1001.

"(d) Whenever the affiant or declarant does not use English as his primary language, the oath or declaration shall be made in his primary language and shall be filed with an English translation, the accuracy of which shall be attested pursuant to such rules as the Commissioner may prescribe.

"§25. Effect of defective execution

"Any document to be filed in the Patent Office and which is required by any law or regulation to be executed in a specified manner may be provisionally accepted by the Commissioner despite a defective execution, provided a properly executed document is submitted within such time as may be prescribed by the Commissioner, not to exceed six months.

"26. Filing by mail

"Any applicant may deposit or cause to be deposited any paper required or permitted by this title to be filed in the United States Patent Office by him or on his behalf in any United States Post Office addressed to the Commissioner of Patents, postage prepaid in the most expeditious class, certified or registered mail, return receipt requested, and the same shall be deemed to have been filed in the Patent Office on the date of its deposit in the Post Office.

"CHAPTER 3.—PRACTICE BEFORE THE PATENT OFFICE

"Sec.

"31. Regulations for agents and attorneys.

"32. Suspension or exclusion from practice.

"33. Unauthorized representation as practitioner.

"§31. Regulations for agents and attorneys

"The Commissioner may prescribe regulations governing the recognition and conduct of agents, attorneys, or other persons representing applicants or other persons before the Patent Office, and may require them, before being recognized as representatives of applicants or other persons, to show that they are of good moral character and reputation and are possessed of the necessary qualifications to render to applicants or other persons valuable service, advice, and assistance in the presentation or prosecution of their applications or other business before the Office.

"§32. Suspension or exclusion from practice

"The Commissioner may, pursuant to rules and regulations duly prescribed, suspend, or exclude, either generally or in any particular case, from further practice before the Office, any person, agent, or attorney shown to be incompetent or disreputable, or guilty of material misconduct, or who does not comply with the regulations established under section 31 of this chapter, or who shall by word, circular, letter, or advertising, with intent to defraud in any manner, deceive, mislead, or threaten any applicant or prospective applicant, or other person having immediate or prospective business before the Office. The reasons for any such suspension or exclusion shall be duly recorded. The United States District Court for the District of Columbia, under such conditions and upon such proceedings as it by its rules determines, may review the action of the Commissioner upon the petition of the person so suspended or excluded.

"§33. Unauthorized representation as practitioner

"(a) Whoever, not being recognized to practice before the Patent Office—

"(1) holds himself out or knowingly permits himself to be held out as so recognized, or

"(2) holds himself out or knowingly permits himself to be held out as available either to perform the service of preparing or prosecuting an application for patent or to provide such service to be performed by a person not so recognized or by an unidentified person, or

"(3) for compensation, either performs the service of preparing or prosecuting an application for patent for another not so recognized or provides such service to be performed by a person not so recognized or by an unidentified person,

shall be punished by imprisonment not exceeding one year, or a fine not exceeding \$1,000 for each offense, or both.

"(b) Where an agent, attorney, or firm recognized to practice before the Patent Office assumes responsibility for the service of preparing or prosecuting a patent application at the time such service is rendered, the service shall be considered as performed by such agent, attorney, or firm within the meaning of this section.

"(c) The district courts of the United States are empowered to issue injunctions forbidding any person guilty of conduct in violation of subsection (a) of this section from further violations and to enforce said injunctions at the suit of the Solicitor or any person injured or likely to be injured by the conduct enjoined, and any person bringing such suit may sue for the penalty prescribed by said subsection (a), in which even one-half shall go to the person suing and the other to the United States.

"CHAPTER 4.—PATENT OFFICE FEES

"Sec.

"41. Patent fees.

"42. Payment of fees; return of excess amounts.

"§41. *Patent fees*

"(a) The Commissioner shall prescribe by regulation the charges to be made for copies of records and publications and for services furnished by the Patent Office other than pursuant to part II of this title designed to effect a recovery in the range of 90 to 110 per centum of the cost to the Patent Office of the copies and services so furnished.

"(b) The Commissioner shall prescribe by regulation the fees to be paid in connection with the filing and examination of patent applications, the issuance and maintenance in force of patents, and other matters set forth in part II of this title as requiring a fee designed together with the fees prescribed pursuant to subsection (a) of this section, to effect an overall recovery in the range of 65 to 75 per centum of the costs of operation of the Patent Office.

"(c) Fees prescribed by the Commissioner pursuant to subsection (b) of this section shall be in multiples of a fee unit amount fixed by the Commissioner to accomplish the purpose of that subsection while maintaining the relative amounts of particular fees as hereinafter prescribed in part II of this title.

"(d) The Commissioner shall prescribe by regulation, consistent with the provisions of this title, the time for payment of the fees to be paid under this title. If payment of the fees in connection with the examination, publication, or issuance of a patent application is not timely made, the application shall be regarded as abandoned. An applicant shall be given at least thirty days following notice of a fee due pursuant to section 137 or 141 of this title in which to pay the fee. Errors in payment of fees may be rectified in accordance with regulations prescribed by the Commissioner.

"(e) The fees established under the authority of this section shall apply to any other Government department or agency, or officer thereof, except that the Commissioner may waive the payment of any fee for service or materials in cases of occasional or incidental requests by a Government department or agency, or officer thereof.

"(f) The Commissioner may prescribe by regulation when copies of Patent Office records and publications may be provided without charge, or at reduced or nominal fees, or in exchange for records or publications of foreign countries.

"§42. *Payments of fees; return of excess amounts*

"All fees shall be paid to the Commissioner, who shall deposit the same in the Treasury of the United States in such manner as the Secretary of the Treasury directs, and the Commissioner may refund any sum paid by mistake or in excess of the fee required.

"CHAPTER 10. PATENTABILITY OF INVENTIONS

"Sec.

"100. Definitions.

"101. Right to patent; inventions patentable.

"102. Conditions for patentability; novelty and non-obvious subject matter.

"103. Conditions for patentability; recovery of right to patent.

"PART II—PATENTABILITY OF INVENTIONS AND GRANT OF PATENTS

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"§100. Definitions

"When used in this title unless the context otherwise indicates—

"(a) The term 'invention' includes both invention and discovery.

"(b) The term 'process' includes process, art, and method and a new process includes a new use of a known process, machine, manufacture, composition of matter, or material.

"(c) The terms 'United States' and 'this country' denote the United States of America, its territories and possessions, and the Commonwealth of Puerto Rico and vessels, aircraft, and vehicles of the United States wherever located.

"(d) The term 'applicant' means any person who has filed or who owns an application for patent as provided in this title.

"(e) The term 'regular worker in the art' includes only persons having ordinary skill in the art to which the subject matter of an invention pertains.

"(f) The term 'knowledge of the art' means information known to the regular workers in the art in the United States or available to those regular workers as a reasonable consequence of a disclosure in tangible form or of a use or a placing on sale anywhere in the world.

"(g) The term 'effective filing date' means the date upon which a complete United States application was filed or the earliest date upon which any United States or foreign application referred to therein and forming the basis for any valid claim of priority therefor was filed, whichever is earlier. A complete application or the resulting patent may contain separate claims for subject matter having different effective filing dates.

"(h) The term 'prior art' means the knowledge of the art prior to the effective filing date of patent application, and the disclosure in a United States patent or published complete application becomes prior art as of its effective filing date.

"(i) The term 'patentee' includes not only the person to whom the patent is issued but also the successors in title to such person.

"(j) The term 'useful' includes, but is not limited to, utility in agriculture, commerce, industry, medicine, or research into any of them.

"(k) An 'approved deposit' shall be a deposit of a microorganism which:

"(1) is made in any public depository in the United States which shall have been designated for such deposits by the Commissioner by publication, and

"(2) is available to the public, except as otherwise prohibited by law, in accordance with such regulations as may be prescribed upon the publication of the complete application which refers to such deposit.

"§101. Right to patent; inventions patentable

"Any invention of a new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement of an existing process, machine, manufacture, or composition of matter, may be the subject of a patent granted pursuant to the conditions and requirements of this title.

"§102. Conditions for patentability; novelty and nonobvious subject matter

"A person claiming ownership of an invention shall be entitled to a patent therefor unless—

"(a) The invention was disclosed in the prior art, or

"(b) Although not identically disclosed in the prior art, the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious on the effective filing date of the patent application to a regular worker in the art. Patentabil-

ity shall not be negated by the manner in which the invention was made. Inventions of a new combination of known mechanical or other elements shall be subject to the same conditions for patentability as are applied to inventions of other types of subject matter.

"§103. *Conditions for patentability; recovery of right to patent*

"Information in the prior art solely as a consequence of disclosure derived from the applicant for a patent or his predecessor in title to the invention shall not negative the patentability of the invention if otherwise patentable upon a complete application filed within twelve months after such disclosure.

"CHAPTER 11.—APPLICATION FOR PATENT

"Sec.

"111. Application for patent.

"112. Complete specification.

"113. Drawings.

"114. Models, specimens.

"115. Statement of claim of ownership.

"116. Preliminary disclosure.

"117. Benefit of earlier filing in foreign country; right of priority.

"118. Benefit of earlier filing in the United States.

"119. Divisional applications.

"120. Confidential status, publication, and abandonment of applications.

"§111. *Application for patent*

"Application for patent shall be made in writing to the Commissioner by a person claiming ownership of the invention. Such application, if a complete application, shall include: (1) a complete specification as prescribed by section 112 of this title; (2) a drawing as prescribed by section 113 of this title; and (3) a statement of claim of ownership as prescribed by section 115 of this title. The complete application must be signed by the applicant, or on behalf of applicant by a person regularly authorized to practice before the Patent Office, and be accompanied by a fee of two fee units. Such application, if a preliminary application, shall include (1) a preliminary disclosure as prescribed by section 116 of this title and (2) a statement of claim of ownership as prescribed by section 115 of this title. The preliminary application must be signed by the applicant, or by any person authorized to act on his behalf who shall, unless he is a person regularly authorized to practice before the Patent Office, state under oath the source of his authority, and be accompanied by a fee of one fee unit.

"§112. *Complete specification*

"(a) The specification shall contain: (i) a description of the invention; (ii) a claim or claims; and (iii) an abstract.

"(b) The description shall disclose the invention in a manner sufficiently clear and complete for the invention to be carried out by a regular worker in the art. When the invention relates to a process involving the action of a microorganism not already known and available to the public or to a production of such a process, the description required by subsection (b) of this section shall be sufficient as to said microorganism, if:

"(1) not later than the date that the complete application is filed, an approved deposit of a culture of the microorganism is made by or on behalf of the applicant or his predecessor in title, and

"(2) the description includes the name of the depository and its designation of the approved deposit and, taken as a whole, is in such descriptive terms as to enable any regular worker in the art to carry it out.

"(c) The claim or claims shall define the matter for which protection is sought. Claims shall be clear and concise. They shall be fully supported by the description.

"A basic claim is a claim to subject matter which may be used independently of the subject matter of any other claim. Basic claims shall be written in independent form and other claims in dependent form. A claim in dependent form shall be construed to include all the limitations of a claim or claims incorporated by reference into the dependent claim.

"An element in a claim for a combination of elements may be expressed as a means or step for performing its function without the recital of structure,

material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof. A claim shall be construed to preserve its validity and to secure to the patentee any patentable invention disclosed in the specification and within the reasonable intendment of the claim, as the specification and claim would be understood by a regular worker in the art.

"(d) The abstract shall briefly summarize the technical features of the invention. It merely serves the purpose of technical information and cannot be taken into account for any other purpose, particularly not for the purpose of interpreting the scope of the protection sought.

"§113. Drawings

"The applicant shall furnish a drawing where necessary for the understanding of the invention. When the nature of the invention admits of illustration by a drawing and the applicant has not furnished such a drawing, the Commissioner may require its submission within a time period of not less than two months from the sending of a notice thereof.

"§114. Models, specimens

"The Commissioner may require the applicant to furnish a model of convenient size to exhibit advantageously the several parts of his invention.

"When the invention relates to a composition of matter, the Commissioner may require the applicant to furnish specimens or ingredients for the purpose of inspection or experiment.

"§115. Statement of claim of ownership

"A statement of claim of ownership shall set forth (1) the name of the applicant; (2) the citizenship, domicile, and post office address of applicant; (3) the person or persons believed to have made the invention; and (4) the basis upon which the applicant claims to have succeeded to the rights of each person named as having made the invention. The applicant shall cause a copy of the statement of claim of ownership to be served promptly upon each person named therein wherever found in any manner sufficient to effect service of process under any subdivision of rule 4 of the Federal Rules of Civil Procedure, and such service may be made by any person other than applicant who is not less than eighteen years of age. Proof of service shall be filed with the Commissioner.

"No error made in the naming of the persons believed to have made the invention shall affect the validity of the application or of a patent issued thereon. The title to an application and to a patent issued thereon shall be determined as prescribed in chapter 25 of this title.

"§116. Preliminary disclosure

"(a) The disclosure shall contain a description of the invention in terms sufficiently plain to enable a regular worker in the art to understand it. A disclosure which if in the prior art would defeat the patentability of the invention under section 102 of this title shall be sufficient disclosure thereof for the purposes of this section 116.

"(b) When the invention relates to a process involving the action of a microorganism not already known and available to the public or to a product of such a process, the description required by subsection (a) of this section shall be sufficient as to said microorganism, if not later than the date that the preliminary application is filed, an approved deposit, of a culture of the microorganism is made by or on behalf of the applicant or his predecessor in title, and the description includes the name of the depository and its designation of the approved deposit and, taken as a whole, is in such terms as to enable any regular worker in the art to understand it.

"§117. Benefit of earlier filing in foreign country; right of priority

"(a) An application for patent for an invention filed in this country by any person who has, or whose legal representatives or assigns have, previously regularly filed an application for a patent for the same invention in a foreign country which affords similar privileges in the case of applications filed in the United States or to citizens of the United States, shall have the same effect as the same application would have if filed in this country on the date on which the application for patent for the same invention was first filed in such foreign

country, if the application in this country is filed within twelve months from the earliest date on which such foreign application was filed.

"(b) No application for patent shall be entitled to this right of priority unless a claim therefor and a certified copy of the original foreign application, specification and drawings upon which it is based are filed in the Patent Office before the patent is granted, or at such time during the pendency of the application as required by the Commissioner not earlier than six months after the filing of the application in this country. Such certification shall be made by the patent office of the foreign country in which filed and show the date of the application and of the filing of the specification and other papers. The Commissioner may require a translation of the papers filed if not in the English language and such other information as he deems necessary.

"(c) In like manner and subject to the same conditions and requirements, the right provided in this section may be based upon a subsequent regularly filed application in the same foreign country instead of the first filed foreign application, provided that any foreign application filed prior to such subsequent application has been withdrawn, abandoned, or otherwise disposed of, without having been laid open to public inspection and without leaving any rights outstanding, and has not served, nor thereafter shall serve, as a basis for claiming a right of priority.

"(d) When the application claiming priority under this section discloses an invention relating to a process involving the action of a microorganism not already known and available to the public or to a product of such a process and an approved deposit is made under section 112, subsection (b), the approved deposit shall be considered to have been made on the earliest date that an application in a foreign country, the priority of which is being claimed, contains a reference identifying a deposit of the same microorganism made in a public depository.

"(e) Applications for inventors' certificates filed in a foreign country in which applicants have a right to apply, at their discretion, either for a patent or for an inventor's certificate shall be treated in this country in the same manner and have the same effect for purpose of the right of priority under this section as applications for patents, subject to the same conditions and requirements of this section as apply to applications for patents, provided such applicants are entitled to the benefits of the Stockholm Revision of the Paris Convention at the time of such filing.

"§118. *Benefit of earlier filing in the United States*

"A complete application for patent for an invention disclosed in the manner provided by section 116 of this title in a complete or a preliminary application previously filed in the United States by the same applicant or by a person through whom an applicant claims ownership shall have the same effect, as to such invention, as though filed on the date of the prior application, if filed before the patenting or publication or abandonment of or termination of proceedings on the first application or on an application similarly entitled to the benefit of the filing date of the first application and if it contains or is amended to contain a specific reference to each earlier application.

"§119. *Divisional applications; double patenting*

"(a) If two or more separately patentable inventions are claimed in one complete application, the Commissioner may require the application to be restricted to one of the inventions. If the other invention is made the subject of a divisional complete application which complies with the requirements of section 118 of this title, it shall be entitled to the benefit of the filing date of the original application. A patent issuing on an application with respect to which a requirement for restriction under this section has been made, or on an application filed as a result of such a requirement, shall not be used as a reference either in the Patent Office or in the courts against a divisional application or against the original application or any patent issued on either of them, if the divisional application is filed before the issuance of the patent on the other application. The validity of a patent shall not be questioned for failure of the Commissioner to require the application to be restricted to one invention.

"(b) If two or more complete applications belonging to the same applicant are pending which appear to relate to inventions that are not patentably sepa-

rate, the Commissioner may require the later filed application to be made the subject of a disclaimer of any terminal part of the term of the patent to be applicant thereon extending beyond the expiration of any patent granted on the first filed application and may require the applicant to undertake to maintain the right to sue for infringement of said patents in the same legal entity. The validity of two or more patents granted on applications belonging to the same applicant shall not be questioned for relating to inventions that are not patentably separate if the patents will expire on the same date as granted or as a result of a disclaimer of a terminal part of the term so long as the right to sue for infringement of said patents is maintained in same legal entity.

"§120. Confidential status, publication, and abandonment of applications

"(a) Applications for patents, unless laid open to public inspection under the provisions of this section, shall be kept in confidence by the Patent Office and no information concerning the same given without authority of the owner unless necessary to carry out the provisions of any Act of Congress or in such special circumstances as may be determined by the Commissioner.

"(b) All complete applications for patents not abandoned and not the subject of a secrecy order under chapter 17 of this title, shall be laid open to public inspection at the request of the applicant or upon receipt of a demand for examination under section 132 of this title or eighteen months after their effective filing date, whichever is earlier, and shall be published as prescribed in section 8 of this title promptly thereafter. The Commissioner shall delete from the text of any application laid open to public inspection or published as prescribed in this section all scandalous matter and may condense or rephrase the text to eliminate therefrom repetition or prolixity without altering the substance of the disclosure.

"(c) Any patent application that has not been laid open to public inspection may be abandoned by a written declaration of abandonment signed by the applicant or on his behalf by a person authorized to practice before the Patent Office stating an intention to abandon the application without leaving any rights outstanding and that the application has not served and will not thereafter serve as a basis for claiming a right of priority anywhere.

"(d) Abandonment of an application for patent does not of itself establish abandonment of an invention disclosed therein.

"CHAPTER 12.—REVIEW AND EXAMINATION OF APPLICATION

"Sec.

"131. Prepublication classification and review.

"132. Examination of application.

"133. Notice of rejection, reexamination.

"134. Procedure to determine recovery of right to patent.

"135. Time for prosecuting application.

"136. Citations in aid of examination.

"137. Examination of related applications.

"138. Appeal to Board of Appeals.

"§131. Prepublication classification and review

"The Commissioner shall promptly cause each complete application to be classified according to the classification maintained pursuant to section 9 of this title and reviewed as to formal matters and to ascertain the text thereof to be laid open to public inspection pursuant to section 120 of this title under the supervision of a patent examiner of the primary grade. The Commissioner shall notify the applicant of the results of the classification and review, stating the reasons therefor. If after receiving such notice, the applicant timely requests re-review, with or without amendment, the application shall be re-reviewed, but the laying open of the application shall not be delayed on account of re-review. A request for re-review shall be timely if received by the Commissioner with a demand for examination by the applicant or within three months after a demand for examination by another. No amendment shall introduce new matter into the disclosure of the invention.

"§132. Examination of application

"Upon receipt of a demand therefor from any person, accompanied by a fee of three fee units, not later than five years after a complete application is laid open to public inspection, the Commissioner shall cause an examination under

the supervision of a patent examiner of the primary examiner grade to be made of the complete application and the claimed invention. There shall be prepared and added to the file of the application and open to the public a search report setting forth the prior art most pertinent to the patentability of the claimed invention considered by the primary examiner. If on such examination it is determined that the applicant is entitled to a patent under the law, the Commissioner shall initiate the granting procedure as hereinafter provided.

"§ 133. Notice of rejection; reexamination

"Whenever, on examination, any claim of a complete application is rejected, or any objection or requirement made, the Commissioner shall notify the applicant thereof, stating the reasons therefor, together with such information and references as may be useful in judging the propriety of continuing the prosecution of the application. If after receiving such notice, the applicant requests reexamination, with or without amendment, the application shall be reexamined. No amendment shall introduce new matter into the disclosure of the invention.

"§ 134. Procedure to determine recovery of right to patent

"Whenever, on examination, any claim of a complete application is rejected, or any objection or requirement made, based upon information in the prior art as a consequence of a disclosure made within twelve months prior to the filing of the complete application, and the applicant, in his request for reexamination, claims the benefit of section 103 of this title, the applicant shall set forth in detail the grounds for his claim together with the names and addresses of any person believed by him to have knowledge of the facts relevant to his claim, together with a fee of one fee unit, and a deposit sufficient to cover the costs, fees and expenses involved, and the Commissioner shall, by subpoena or commission or letters rogatory issued pursuant to section 23 of this title to give testimony by deposition on written questions in the manner prescribed by and for rule 31 of the Federal Rules of Civil Procedure, require such person to give evidence under oath concerning such facts. The Solicitor shall pose such cross-questions as may be appropriate in aid of the reexamination. Reexamination shall include an express ruling on the sufficiency of applicant's claim, stating the reasons therefor.

"§ 135. Time for prosecuting application

"(a) Upon failure of the applicant to claim the priority of a preliminary application in a complete application filed within one year after the filing of the preliminary application the preliminary application shall become abandoned.

"(b) Unless a demand for examination of a complete application is received by the Commissioner within five years after the application is laid open to public inspection the application shall become abandoned.

"(c) Upon failure of the applicant to respond within six months to any action in a published application of which action notice has been given or mailed to the applicant, or within such shorter time, not less than thirty days, as fixed by the Commissioner in the action, the application shall become abandoned, unless it be shown to the satisfaction of the Commissioner that failure was unavoidable.

"§ 136. Citations in aid of examination

"(a) Any person may, with or without disclosure of his identity, at any time notify the Commissioner of prior art which may have a bearing on the patentability of a specified published and pending application, without requesting the examination thereof, with written explanation of the pertinency of that prior art, and the Commissioner shall cause such notice and explanation to be placed in the file of such application to be considered by the Patent Office upon the examination thereof.

"(b) The applicant and any person demanding examination of an application under section 132 of this title may notify the Commissioner of the name and address of any person subject to service of process of any court of the United States whom he believes may be in possession of knowledge of prior art more pertinent to the patentability of a published and pending application than that cited in the search report, together with a fee of one fee unit and a deposit

sufficient to cover the costs, fees, and expenses involved, and the Commissioner shall, by subpoena issued pursuant to section 23 of this title to give testimony by deposition on written questions in the manner prescribed by and for rule 31 of the Federal Rules of Civil Procedure, require such person to give evidence under oath of all such prior art known to him. The Solicitor shall pose such cross-questions as may be appropriate in aid of the examination.

"(c) The primary examiner supervising the examination of an application under section 132 of this title may notify the Solicitor of any person subject to service of process of any court of the United States whom he believes may be in possession of knowledge of prior art more pertinent to the patentability of a published and pending application than that cited in the search report, and the Commissioner shall, by subpoena issued pursuant to section 23 of this title to give testimony by deposition on written questions in the manner prescribed by and for rule 31 of the Federal Rules of Civil Procedure, require such person to give evidence under oath of all such prior art then known to him. The applicant and any person who has demanded examination of the application may pose appropriate cross-questions.

"§137. *Examination of related applications*

"When examination of an application is demanded under section 132 of this title, the Commissioner may call upon the applicant to complete and request examination of any other application of his which may be pending and which claims the date of the first mentioned application or of any application the date of which is claimed by the first mentioned application and to pay any fee prescribed for the requested examination. Notice shall be given the applicant of the fee due and a time of not less than thirty days shall be set for payment. If the fee is paid within the specified time, examination shall proceed on all such applications concurrently. If the fee is not paid within such time, the applications on which the required fee has not been paid shall become abandoned.

"§138. *Appeal to Board of Appeals*

"An applicant for a patent, any of whose claims has been twice rejected or whose application has been made the subject of any objection or requirement not acceded to by him during its review and examination pursuant to sections 131-137 of this title, may appeal from the decision of the primary examiner involved to the Board of Appeals, having once paid a fee of three fee units for such appeal. The Solicitor shall appear before the Board and present the position of the primary examiner. Proceedings before the Board of Appeals shall be open to the public.

"CHAPTER 13.—GRANT OF PATENT

"Sec.

"141. Publication of allowable application.

"142. Recall of notice of prima facie allowability.

"143. Conditions for patent issue.

"144. How issued.

"145. Contents and term of patent.

"§141 § *Publication of allowable application*

"(a) If it is determined, on examination, or reexamination, or by decision of the Board of Appeals, that an applicant is entitled to a patent under the law, a written notice of prima facie allowability of the application shall be given or mailed to the applicant. The notice shall specify a fee of two fee units, upon payment of which within the time established, notice that the application has been found prima facie allowable shall be published together with any changes from the text of the application published under section 120 of this title.

"(b) If any payment required by this section is not timely made, but is submitted with the fee for delayed payment within three months after the due date and sufficient cause is shown for the late payment, it may be accepted by the Commissioner as though no abandonment or lapse had ever occurred.

"§142. *Recall of notice of prima facie allowability*

"(a) Any person, including, ex officio, the Solicitor and the head of an agency or department of the Government, may petition the Patent Office to recall a prima facie notice of allowability within sixty days of the date

thereof and to reexamine, pursuant to Chapter 12 of this title, the patentability of any claim of an application in view of designated prior art. Such petition shall explain the pertinency of the prior art cited and, unless filed by the Solicitor, shall be accompanied by a fee of ten fee units.

"(b) Any petitioner may notify the Commissioner of the name and address of any person subject to service of process of any court of the United States whom he believes may be in possession of knowledge of prior art more pertinent to the patentability of the application than that cited in the search report, together with the fee of one fee unit and a deposit sufficient to cover the costs, fees, and expenses involved, and the Commissioner shall, by subpoena issued pursuant to Section 23 of this title to give testimony by deposition on written questions in the manner prescribed by and for rule 31 of the Federal Rules of Civil Procedure, require such person to give evidence under oath of all such prior art known to him. The applicant may pose such cross-questions as may be appropriate in aid of the examination.

"(c) If the applicant or any petitioner is dissatisfied with the decision of the primary examiner on re-examination pursuant to subsection (a) of this section, he may appeal from that decision to the Board of Appeals, having once paid the fee for such appeal.

"(d) The decision of the Board of Appeals on an appeal pursuant to subsection (c) of this section shall, unless appealed pursuant to section 151 of this title, be determinative of Patent Office action on an application.

"§143. *Conditions for patent issue*

"(a) If no petition is filed pursuant to section 142 of this title, the Commissioner shall grant a patent as provided in Section 144 and 145 of this title in conformity with the text published pursuant to section 141 of this title.

"(b) If a petition has been filed pursuant to section 142 of this title, the Commissioner shall grant a patent as directed in a final decision on that petition from which no further appeal has been or can be taken.

"(c) No patent shall issue unless the applicant shall have paid a fee of two fee units.

"§144. *How issued*

"Patents shall be issued in the name of the United States of America, under the seal of the Patent Office, and shall be signed by the Commissioner or have his signature placed thereon, and shall be recorded in the Patent Office.

"§145. *Contents and term of patent*

"(a) Every patent shall contain a grant to the applicant, his heirs or assigns, of the right, during the term of the patent, to exclude others, pursuant to Part III of this title, from making use of the patented subject matter throughout the United States, referring to the specification for the particulars thereof. A copy of the specification and drawings shall be annexed to the patent and be a part thereof.

"(b) The term of a patent shall expire, if the fees prescribed by subsection (c) of this section have been timely paid, twenty years from the date of filing the application in the United States or, if the benefit of the filing date in the United States of a prior application is claimed, from the earliest such prior date claimed. In determining the term of the patent, the date of filing any application in a foreign country which may be claimed by the applicant shall not be taken into consideration.

"(c) A patent shall lapse under the fees prescribed for its maintenance in force shall be paid on or before the fifth, tenth, and fifteenth anniversaries of the date of filing the application therefore in the United States, as follows:

Fifth anniversary, four fee units;
Tenth anniversary, ten fee units; and
Fifteenth anniversary, twenty fee units.

"CHAPTER 14.—REVIEW OF PATENT OFFICE DECISIONS

"Sec.

"151. Appeal to Court of Customs and Patent Appeals.

"152. Notice of appeal.

"153. Proceedings on appeal.

"154. Decision on appeal.

"§151. *Appeal to Court of Customs and Patent Appeals*

"(a) An applicant dissatisfied with the decision of the Board of Appeals pursuant to section 138 of this title may appeal to the United States Court of Customs and Patent Appeals.

"(b) An applicant or any petitioner dissatisfied with the decision of the Board of Appeals pursuant to section 142 of this title may appeal to the United States Court of Customs and Patent Appeals.

"§152. *Notice of appeal*

"(a) When an appeal is taken to the United States Court of Customs and Patent Appeals pursuant to subsection (a) of section 151 of this title, the appellant shall file in the Patent Office a written notice of appeal directed to the Commissioner within such time after the date of the decision appealed from, not less than sixty days, as the Commissioner appoints.

"(b) When an appeal is taken to the United States Court of Customs and Patent Appeals pursuant to subsection (b) of section 151 of this title, the appellant shall file a written notice of appeal within such time after the date of the decision appealed from, not less than sixty days, as the Commissioner appoints. The Patent Office shall serve notice of the filing of the notice of appeal by mailing a copy thereof to the attorney or agent of record of each party other than the appellant, or if a party is not represented by an attorney or agent, to the party at his last known address.

"§153. *Proceedings on appeal*

"The Patent Office shall transmit to the United States Court of Customs and Patent Appeals certified copies of all the necessary papers and evidence designated by the appellant and any additional papers and evidence designated by any other party. The Commissioner shall appear in court by the Solicitor and present the position of the Patent Office. The court shall, before hearing an appeal, give notice of the time and place of the hearing to the appellant and all other parties.

"§154. *Decision on appeal*

"The United States Court of Customs and Patent Appeals shall review the decision appealed from on the evidence produced before the Patent Office and transmitted to the court under the provisions of section 153 of this title. Upon its determination the court shall return to the Commissioner a certificate of its proceedings and decision, which shall be entered of record in the Patent Office and govern the further proceedings in the case.

"CHAPTER 15.—PLANT PATENTS

"Sec.

"161. Patents for plants.

"162. Description, claim.

"163. Grant.

"164. Assistance of Department of Agriculture.

"§161. *Patents for plants*

"(a) Whoever invents or discovers and asexually reproduces any distinct and new variety of plant including cultivated sports, mutants, hybrids, and newly found seedlings, other than a tuber propagated plant or a plant found in an uncultivated state, may obtain a patent therefor, subject to the conditions and requirements of this title.

"(b) The provisions of this title relating to patents for inventions shall apply to patents for plants, except as otherwise provided.

"§162. *Description, claim*

"No plant patent shall be declared invalid for noncompliance with section 112 of this title if the description is as complete as is reasonably possible.

"The claim in the specification shall be in formal terms to the plant shown and described.

"§163. *Grant*

"In the case of a plant patent the grant shall be of the right to exclude others from asexually reproducing the plant or selling or using the plant so reproduced.

“§164. *Assistance of Department of Agriculture*

“The President may by Executive order direct the Secretary of Agriculture, in accordance with the requests of the Commissioner, for the purpose of carrying into effect the provisions of this title with respect to plants (1) to furnish available information of the Department of Agriculture, (2) to conduct through the appropriate bureau or division of the Department research upon special problems, or (3) to detail to the Commissioner officers and employees of the Department.

“CHAPTER 16.—DESIGNS

“Sec.

“171. Patents for designs.

“§ 172. Right of priority.

“173. Term of design patent.

“§171. *Patents for designs*

“(a) Whoever invents any new, original and ornamental design for an article of manufacture may obtain a patent therefor, subject to the conditions and requirements of this title.

“(b) The provisions of this title relating to patents for inventions shall apply to patents for designs, except as otherwise provided.

“§172. *Right of priority*

“The right of priority provided for by section 117 of this title shall be six months in the case of designs.

“§173. *Term of design patent*

“Patents for designs may be granted for the term of three years and six months, or for seven years, or for fourteen years, as the applicant, in his application, elects.

“CHAPTER 17.—SECRECY AND FILING APPLICATIONS IN FOREIGN COUNTRIES

“Sec.

“181. Secrecy and withholding of patent.

“182. Abandonment of subject matter by reason of unauthorized disclosure.

“183. Right to compensation.

“184. Filing of application in foreign countries.

“185. Patent barred for filing without license.

“186. Penalty.

“187. Nonapplicability to certain persons.

“188. Rules and regulations, delegation of power.

“§181. *Secrecy and withholding of patent*

“(a) Whenever publication or disclosure of the subject matter of an application for patent in which the Government has a property interest might, in the opinion of the head of an interested Government agency, be detrimental to the national security, the Commissioner upon being so notified shall order that the subject matter be kept secret and shall withhold disclosure thereof and the grant of a patent therefor under the conditions set forth hereinafter.

“(b) Whenever publication or disclosure of the subject matter of an application for patent in which the Government does not have a property interest, might, in the opinion of the Commissioner, be detrimental to the national security, the Commissioner shall within two months of the date on which the application was filed in the United States, make the application for patent in which subject matter is disclosed available for inspection to the Atomic Energy Commission, the Secretary of Defense, and the chief officer of any other department or agency of the Government designated by the President as a defense agency of the United States.

“(c) Each individual to whom the application is disclosed shall sign a dated acknowledgement thereof, which acknowledgement shall be entered in the file of the application. If, in the opinion of the Atomic Energy Commission, the Secretary of Defense, or the chief officer of another department or agency so designated, the publication or disclosure of such effect for the duration of the hostilities and one year following cessation of hostilities. An order in effect, or issued, during a national emergency declared by the President shall remain in effect for the duration of the national emergency and six months thereafter. The Commissioner may rescind any order upon notification by the head of the

department or agency which caused the order to be issued that the publication or disclosure of such subject matter is no longer deemed detrimental to the national security.

"§182. Abandonment of subject matter by reason of unauthorized disclosure

"Subject matter disclosed in an application for patent subject to an order made pursuant to section 181 of this chapter shall be held abandoned upon a determination by a member of the Board of Appeals, pursuant to section 5(c) of this title, in such proceedings as the Commissioner shall by regulation establish, that in violation of said order such subject matter has been published or disclosed or that an application for a patent therefor has been filed in a foreign country by the inventor, his successors, assigns, or legal representatives, or anyone in privity with him or them, without the consent of the Commissioner. The consent of the Commissioner shall not be given without the concurrence of the heads of the departments and agencies which caused the order to be issued. The abandonment shall be held to have occurred as of the time of violation. A holding of abandonment shall abrogate all claims against the United States based upon such subject matter by the applicant, his successors, assigns, or legal representatives, or anyone in privity with him or them.

"§183. Right to compensation

"An applicant, or patentee, or his legal representatives, whose patent is withheld as herein provided, shall have the right, beginning at the date the applicant is notified that, except for such order, his application is otherwise in condition for allowance, and ending six years after a patent is issued thereon, to apply to the head of any department or agency who caused the order to be issued for compensation for the damage caused by the order of secrecy and/or for the use of such subject matter by the Government resulting from his disclosure. The right to compensation for use by the Government shall begin on the date of the first use of such subject matter by the Government and shall terminate not later than twenty years from the actual filing date in the United States. The head of the department or agency is authorized, upon the presentation of the claim, to enter into an agreement with the applicant, or patentee, or his legal representatives, in full settlement for the damage and/or use. This settlement agreement shall be conclusive for all purposes notwithstanding any other provision of law to the contrary. If full settlement of the claim cannot be effected, the head of the department or agency may award and pay to such applicant, or patentee, or his legal representatives, a sum not exceeding 75 per centum of the sum which the head of the department or agency considers just compensation for the damage and/or use. A claimant may bring suit against the United States in the Court of Claims or in the district court of the United States for the district in which such claimant is a resident for an amount which when added to the award shall constitute just compensation for the damage and/or use of such subject matter, by the Government. The owner of any patent issued upon an application that was subject to a secrecy order issued pursuant to section 181 of this chapter, who did not apply for compensation as above provided, shall have the right, after the date of issuance of such patent, to bring suit in the Court of Claims for just compensation for the damage caused by reason of the order of secrecy and/or use by the Government of such subject matter resulting from his disclosure. The right to compensation for use by the Government shall begin on the date of the first use of the invention by the Government and shall terminate not later than twenty years from the actual filing date in the United States of the patent. In a suit under the provisions of this section the United States may avail itself of all defenses it may plead in an action under section 1498 of title 28. This section shall not confer a right of action on anyone or his successors, assigns, or legal representatives who, while in the full-time employment or service of the United States, discovered, invented, or developed the subject matter on which the claim is based.

"§184. Filing of application in foreign country

"(a) Except when authorized by a license obtained from the Commissioner, a person shall not file or cause or authorize to be filed in any foreign country prior to six months after filing an application for patent in the United States an application for patent or for the registration of a utility model, industrial design or model in respect of an invention made in this country. A license

shall not be granted with respect to an invention subject to an order issued by the Commissioner pursuant to section 181 of this chapter without the concurrence of the head of the department or agency which caused the order to be issued.

"(b) The term 'application' when used in this chapter includes applications and any modifications, amendments, or supplements thereto, or divisions thereof.

"(c) No license shall be required subsequent to the filing of a foreign application for any modifications, amendments, or supplements to that foreign application, or divisions thereof, which do not alter the nature of the subject matter originally disclosed, which are within the scope of the subject matter originally disclosed, and where the filing of the foreign application originally complied with the provisions of this section, unless the applicant has been notified by the Commissioner that a specific license is required for filing such papers in connection with any application.

"§185. Patent barred for filing without license

"(a) Notwithstanding any other provisions of law any person, and his successors, assigns, or legal representatives, shall not receive a United States patent for subject matter described in an application if that person, or his successors, assigns, or legal representatives shall, without procuring any license made necessary by section 184 of this chapter, have made, or consented to or assisted another's making, application in a foreign country for a patent or for the registration of a utility model, industrial design, or model in respect to such subject matter. A United States patent if issued for such invention to such person, his successors, assigns or legal representatives shall be invalid.

"(b) A license may be granted retroactively where an application has been inadvertently filed abroad and the application does not disclose an invention within the scope of section 181 of this title if it is applied for within three months of the date the inadvertent filing is brought to the attention of applicant.

"186. Penalty

"Whoever, during the period or periods of time any subject matter has been ordered to be kept secret and the grant of a patent thereon withheld pursuant to section 181 of this chapter, shall, with knowledge of such order and without due authorization, willfully publish or disclose or authorize or cause to be published or disclosed the subject matter or material information with respect thereto, or whoever, in violation of the provisions of section 184 of this chapter, shall file or cause or authorize to be filed in any foreign country an application for patent or for the registration of a utility model, industrial design, or model in respect of an invention made in the United States, shall, upon conviction, be fined not more than \$10,000 or imprisoned for not more than two years, or both.

"§187. Nonapplicability to certain persons

"The provisions and penalties of this chapter shall not apply to any officer or agent of the United States acting within the scope of his authority, nor to any person acting upon his written instructions or permission.

"§188. Rules and regulations, delegation of power

"The Atomic Energy Commission, the Secretary of Defense, the chief officer of any other department or agency of the Government designated by the President as a defense agency of the United States, and the Patent Office, may separately issue rules and regulations to enable the respective department or agency to carry out the provisions of this chapter, and may delegate any power conferred by this chapter.

"CHAPTER 18.—AMENDMENT AND CORRECTION OF PATENT RIGHTS

"Sec.

"191. Republication of defective applications.

"192. Effect of republication.

"193. Disclaimer.

"194. Certificate of correction of Patent Office mistake.

"195. Certification of correction of applicant's mistake.

"196. Correction of named inventor.

"§191. *Republication of defective applications*

"(a) Whenever any published and pending or patented application is, through error without any deceptive intention, found to be misleading or incomplete, by reason of a defective disclosure or drawing, or by reason of the applicant claiming other than he had a right to claim, the Commissioner shall, upon the petition of the owner and the payment of the fee required by law, republish the application for the invention disclosed in the original application to be effective in accordance with the republished application, for the term measured by the original application. No new matter shall be introduced into the republished application.

"(b) The provisions of this title relating to original applications for patent shall be applicable to republished applications.

"(c) A petition to republish an application may be filed at any time within twenty-six years of the earliest priority date claimed under section 118 of this title in the original application. If a patent has been granted upon the original application, the petition shall reopen the republished application for examination in all respects.

"§192. *Effect of republication*

"(a) Every republished application shall have the same effect and operation in law, on the trial of actions for causes thereafter arising, as if the same had been originally published in such amended form, but insofar as the claims of the original and republished applications are identical, such republication shall not affect any action then pending nor abate any cause of action then existing, and the republished application, to the extent that its claims are identical with the original application, shall constitute a continuation thereof and have effect continuously from the date of the original application.

"(b) No republished application shall abridge or affect the right of any person or his successors in business who made, purchased or used prior to the republication anything claimed by the republished application, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased or used, unless the making, using or selling of such thing infringes a valid claim of the republished application which was in the original application. The court before which such matter is in question may provide for the continued manufacture, use or sale of the thing made, purchased or used as specified, or for the manufacture, use or sale of which substantial preparation was made before the republication, and it may also provide for the continued practice of any process claimed by the republished application, practiced, or for the practice of which substantial preparation was made, prior to the republication, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced before the republication and in reasonable reliance on the text of the original application.

"§193. *Disclaimer*

"(a) Whenever, without any deceptive intention, a claim of a published application or patent is invalid the remaining claims shall not thereby be rendered invalid. The owner, whether of the whole or any sectional interest therein, may, on payment of the fee required by law, make disclaimer of any complete claim, stating therein the extent of his interest in such published application or patent. Such disclaimer shall be in writing and recorded in the Patent Office. It shall thereafter be considered as part of the original published application or patent to the extent of the interest possessed by the disclaimant and by those claiming under him.

"(b) In like manner any patentee or applicant may disclaim or dedicate to the public the entire term, or any terminal part of the term, of the patent granted or to be granted.

"§194. *Certificate of correction of Patent Office mistake*

"Whenever a mistake in a published application or patent, incurred through the fault of the Patent Office, is clearly disclosed by the records of the Office, the Commissioner may issue a certificate of correction stating the fact and nature of such mistake, under seal, without charge, to be recorded in the records of the Patent Office. A printed copy thereof shall be attached to each printed copy of the published application and patent, and such certificate shall be considered as part of the original published application and patent. Every

such published application and patent, together with such certificate, shall have the same effect and operation in law on the trial of actions for causes thereafter arising as if the same had been originally issued in such corrected form. The Commissioner may issue a corrected published application or patent without charge in lieu of and with like effect as a certificate of correction.

"§195. Certificate of correction of applicant's mistake

"Whenever a mistake of a clerical or typographical nature, or of minor character, which was not the fault of the Patent Office, appears in a published application or patent and a showing has been made that such mistake occurred in good faith, the Commissioner may, upon payment of the required fee, issue a certificate of correction, if the correction does not involve such changes in the published application or patent as would constitute new matter or would require re-examination. Such published application or patent, together with the certificate, shall have the same effect and operation in law on the trial of actions for causes thereafter arising as if the same had been originally issued in such corrected form.

"§196. Correction of named inventor

"Omission of an inventor's name or inclusion of the name of a person not an inventor or both, without deceptive intent, shall not affect validity of a published application or patent, and may be corrected at any time by the Commissioner in accordance with regulations established by him or upon order of a court of competent jurisdiction before which the matter is called in question. Upon such correction the Commissioner shall issue a certificate accordingly.

"PART III—PATENTS AND PROTECTION OF PATENT RIGHTS

"Chapter	Sec.
"25. Ownership, assignment, and abandonment -----	251
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"CHAPTER 25.—OWNERSHIP, ASSIGNMENT, AND ABANDONMENT

"Sec.

"251. Ownership, assignment, and abandonment.

"252. Joint owners.

"253. Determination of title disputes.

"§251. Ownership, abandonment, and assignment

"(a) Subject to the provisions of this title, inventions, applications, and patents shall have the attributes of personal property.

"(b) Inventions are the property of their inventors when made, subject to any preexisting rights and duties with respect thereto created by contract or operation of law. Unless an invention is made the subject of an application pursuant to this title or is caused to become a part of the prior art to such an application, it is abandoned for the purposes of this title only, subject however to the defense provided in section 282(b) of this title.

"(c) Applications for patent, patents, or any interest therein, shall be assignable in law by an instrument in writing. An applicant or a patentee may in like manner grant and convey an exclusive right under his application for patent, or patent, to the whole or any specified part of the United States for the whole or any specified part of the right secured thereby.

"(d) A certificate of acknowledgement under the hand and official seal of a person authorized to administer oaths within the United States, or in a foreign country, of a diplomatic or consular officer of the United States or an officer authorized to administer oaths whose authority is provided by a certificate of a diplomatic or consular officer of the United States, shall be prima facie evidence of the execution of an assignment, grant or conveyance of a patent or application for patent.

"(e) An assignment, grant, or conveyance, and any license or waiver, such as an easement, quitclaim, covenant not to sue, release, or the like, purporting to operate in any manner after its own date shall be void as against any subsequent purchaser or mortgagee for a valuable consideration, without notice, unless it is recorded in the Patent Office within three months from its date or prior to the date of such subsequent purchase or mortgage.

"§252. Joint owners

"In the absence of any agreement to the contrary recorded in the Patent Office, each of the joint owners of a published application or patent may make use, or have use made for him, of the invention claimed without the consent of and without accounting to the other owners, but, except with the consent of the other owners, the interest of a joint owner of a published application or patent may be transferred only to another joint owner or by inheritance or bequest, and a license or waiver of a right conferred by a jointly-owned patent or application can be made only by all the joint owners.

"§253. Determination of title disputes

"Title to any invention, application, or patent may be determined by civil action or other appropriate proceeding in any court of competent jurisdiction and the Commissioner shall give effect to final judgment in such proceeding as required by law and in accordance with the principles of equity.

"CHAPTER 26.—GOVERNMENT INTERESTS IN PATENTS

"Sec.

"261. Time for taking action in Government applications.

"§261. Time for taking action in Government applications

"Notwithstanding the provisions of Chapter 12 of this title, the Commissioner may extend the time for taking any action to three years, when an application has become the property of the United States and the head of the appropriate department or agency of the Government has certified to the Commissioner that the invention disclosed therein is important to the armament or defense of the United States.

"CHAPTER 27.—INFRINGEMENT OF PATENTS

"Sec.

"271. Infringement of patent.

"272. Temporary presence in the United States.

"§271. Infringement of patent

"(a) Except as otherwise provided in this title, whoever without authority of the patentee makes use within the United States in the useful arts of any patented invention during the term of the patent therefor infringes the patent. Without limitation on the generality of the foregoing, a person makes use of a patented invention within the United States, *inter alia*, if he:

"(i) practices within the United States a process defined by a claim of the patent;

"(ii) makes, uses, or sells within the United States a machine, manufacture, or composition of matter defined by a claim of the patent;

"(iii) imports into the United States a product made outside the United States by a process defined by a claim of the patent;

"(iv) makes, uses, or sells within the United States a component of a machine, manufacture, or composition of matter defined by a claim of the patent, or a material or apparatus for practicing a process defined by a claim of the patent, knowing the same to be especially made or adapted for making use within or without the United States of the subject matter so defined if such component or material or apparatus is not a staple article or commodity of commerce suitable for substantial other use.

"(b) Whoever actively induces infringement of a patent shall be liable as an infringer.

"(c) No patent owner otherwise entitled to relief under subsections (a) or (b) of this section shall be denied relief or deemed guilty of misuse or illegal extension of the patent right by reason of his having done one or more of the following: (1) derived revenue from acts which it performed by another without his consent would establish liability under subsections (a) or (b) of this section; (2) licensed or authorized another to perform acts which if performed without his consent would establish liability under subsections (a) or (b) of this section; (3) sought to enforce his patent rights under subsections (a) or (b) of this section.

"(d) Whoever, during the interim period after an application is laid open to public inspection under section 120 of this title and before issue of a patent, performs acts which, if performed after issue of the patent, would make him

liable for infringement of a valid claim of the patent shall be liable for those acts as an infringer is that claim appears in the application as laid open to public inspection and in the issued patent.

"§272. Temporary presence in the United States

"The use of any invention in any vessel, aircraft, or vehicle of any country which affords similar privileges to vessels, aircraft, or vehicles of the United States, entering the United States temporarily or accidentally, shall not constitute infringement of any patent, if the invention is used exclusively for the needs of the vessel, aircraft, or vehicle and is not sold in or used for the manufacture of anything to be sold in or exported from the United States.

"CHAPTER 28.—REMEDIES FOR INFRINGEMENT OF PATENT, AND OTHER ACTIONS

"Sec.

"281. Remedy for infringement of patent.

"282. Defenses.

"283. Injunction.

"284. Damages.

"285. Attorney fees.

"286. Time limitation on damages.

"287. Mitigation of damages; marking and notice.

"288. Action for infringement of a patent containing an invalid claim.

"289. Additional remedy for infringement of design patent.

"290. Notice of patent suit.

"291. False marking.

"292. Nonresident applicant and patentee; service and notice.

"293. Presumptions and estoppels; cancellation.

"§281. Remedy for infringement of patent

"A patentee shall have remedy by civil action for infringement of his patent.

"§282. Defenses

"(a) The following shall be defenses in any action involving the validity or infringement of a patent and shall be pleaded:

"(1) Noninfringement, absence of liability for infringement, or unenforceability.

"(2) Invalidity of the patent or any claim in suit on any ground specified in part II of this title as a condition for patentability.

"(3) Invalidity of the patent or any claim in suit for failure to comply with any requirement of sections 112 or 191 of this title.

"(4) Any other fact or act made a defense by this title.

"(b) There is an absence of liability for infringement of a patent by any person who, in the United States, on or before the effective filing date of the application for the patent was, in good faith commercially manufacturing the product or using the process claimed, or had made substantial preparation especially for such manufacture or use, and such person shall have the right to continue such manufacture or use despite the patent and to sell the products thereof, but such right shall be personal and nontransferable except with the person's entire business in the manufacture or use involved.

"(c) In actions involving the validity or infringement of a patent the party asserting invalidity or noninfringement shall give notice in the pleadings or otherwise in writing to the adverse party as required by operation of the Federal Rules of Civil Procedure, but in no event less than thirty days before the trial, of the prior art to be relied upon as affecting the validity or scope of the patent, setting forth specific identification of every exhibit and every witness to be relied upon in proof thereof. In the absence of such notice proof of said matters may not be made at the trial except on such terms as the court requires.

"(d) A patent though otherwise found valid and infringed shall be unenforceable so long as it is serving as a material aid in effecting a violation of the antitrust laws culpably involving the patentee.

"(e) The burden of establishing invalidity of a patent or any claim thereof, infringement, absence of liability for infringement, or unenforceability shall rest on the party asserting it.

“§283. *Injunction*

“(a) The several courts having jurisdiction of cases under this title may grant injunctions in accordance with the principles of equity to prevent the violation of any right secured by patent, on such terms as the court deems reasonable.

“(b) No injunction shall be granted with respect to subsequent use or sale of machines, manufactures, or compositions of matter made prior to the grant of the patent and for which damages are awarded under section 284(b) of this title.

“§284. *Damages*

“(a) Upon finding for the claimant, the court shall award the claimant damages adequate to compensate for the infringement but in no event less than the infringer's profits attributable to the infringement or less than a reasonable royalty for the use made of the invention by the infringer, together with interest and costs as fixed by the court.

“(b) Damages for acts set forth in section 271(d) of this title shall be awarded only for acts occurring after actual notice to the infringer stating how his acts are considered to infringe a claim of an application laid open to public inspection.

“(c) When the damages are not found by a jury, the court shall assess them. The court may increase the damages up to three times the amount found or assessed.

“(d) The court may receive expert testimony as an aid to determination of damages or of what royalty would be reasonable under the circumstances.

“§285. *Attorney fees*

“The court in appropriate cases may award reasonable attorney fees to the prevailing party.

“§286. *Time limitation on damages*

“(a) Except as otherwise provided by law, no recovery shall be had for any infringement committed more than six years prior to the filing of the complaint or counterclaim for infringement in the action.

“(b) In the case of claims against the United States Government for use of a patented invention, the period before bringing suit, up to six years, between the date of receipt of a written claim for compensation by the department or agency of the Government having authority to settle such claim, and the date of mailing by the Government of a notice to the claimant that his claim has been denied shall not be counted as part of the period referred to in the preceding paragraph.

“§287. *Mitigation of damages; marking and notice*

“Patentees, applicants, and persons making use of any patented invention for or under them that is the subject of a patent or a published application therefor, may give notice to the public thereof either by fixing to an article the word ‘patent’ or the abbreviation ‘pat.’ or the words ‘patent applied for’ or the abbreviation ‘pat. app. for.’ together with the number of the patent or application related thereto, or when, from the character of the article, this can not be done, by fixing to it, or to the package wherein one or more of them is contained, a label containing a like notice. The failure so to mark may be proved as an element in mitigation of damages or diminution of what royalty would be reasonable prior to the date when the infringer was notified of the infringement. Filing of an action for infringement shall constitute such notice.

“§288. *Action for infringement of a patent containing an invalid claim*

“Whenever, without deceptive intention, a claim of a patent is invalid, an action may be maintained for the infringement of a claim of the patent which may be valid. The patentee shall recover no costs unless a disclaimer has been entered, or a proceeding under section 191 of this title commenced, in the Patent Office with respect to the invalid claim before the commencement of the suit.

“§289. *Additional remedy for infringement of a design patent*

“(a) Whoever during the term of a patent for a design, without license of the owner, (1) applies the patented design, or any colorable imitation thereof,

to any article of manufacture for the purpose of sale, or (2) sells or exposes for sale any article of manufacture to which such design or colorable imitation has been applied shall be liable to the owner to the extent of his total profit, but not less than \$250, recoverable in any United States district court having jurisdiction of the parties.

"(b) Nothing in this section shall prevent, lessen, or impeach any other remedy which an owner of an infringed patent has under the provisions of this title, but he shall not twice recover the profit made from the infringement.

"§290. *Notice of patent suits*

"The clerks of the courts of the United States, within one month after the filing of an action under this title, shall give notice thereof in writing to the Commissioner, setting forth so far as known the names and addresses of the parties, name of the inventor, and the designating number of the patent upon which the action has been brought. If any other patent is subsequently included in the action he shall give like notice thereof. Within one month after the decision is rendered or a judgment issued the clerk of the court shall give notice thereof to the Commissioner. The Commissioner shall, on receipt of such notices, enter the same in the file of such patent.

"§291. *False marking*

"(a) Whoever, without the consent of the patentee, marks upon, or affixes to, or uses in advertising in connection with anything made, used, or sold by him, the name of any imitation of the name of the patentee, the patent number, or the words 'patent,' 'patentee,' or the like, with the intent of counterfeiting or imitating the mark of the patentee, or of deceiving the public and inducing them to believe that the thing was made or sold by or with the consent of the patentee; or

"Whoever marks upon, or affixes to, or uses in advertising in connection with any unpatented article, the word 'patent' or any word or number importing that the same is patented, for the purpose of deceiving the public; or

"Whoever marks upon, or affixes to, or uses in advertising in connection with any article, the words 'patent applied for,' 'patent pending,' or any word importing that an application for patent has been made, when no application for patent has been made, or if made, is not pending, for the purpose of deceiving the public—

"Shall be fined not less than \$500 for the first occurrence of every such offense and not more than \$500 for each day any such offense is repeated.

"(b) Any person may sue for the penalty, in which event one-half shall go to the person suing and the other to the use of the United States.

"§292. *Nonresident applicant, patentee, or other party to Patent Office proceeding; service and notice*

"(a) Every applicant and every patentee not residing in the United States may file in the Patent Office a written designation stating the name and address of a person residing within the United States on whom may be served process or to whom may be mailed notice of proceedings affecting the application or the patent or rights thereunder. If the person designated cannot be found at the address given in the last designation, or if no person has been designated, such process or notice may be served as provided for service of process by publication in civil actions in the District of Columbia and the court or agency concerned shall have the same jurisdiction to take any action respecting the application or patent or rights thereunder that it would have if the applicant or patentee were personally served.

"(b) Every person not residing in the United States who files a demand under section 132 of this title or a petition under section 142 of this title or claims under section 134 of this title shall file therewith a written designation stating the name and address of a person residing within the United States on whom may be served process and to whom may be mailed notice of proceedings affecting the demand or petition.

"§293. *Presumptions and estoppels; cancellation*

"(a) Actions of the Commissioner are administrative in nature and are entitled to the usual presumption that they are correct and legal. Review, re-review, examination, and reexamination of applications, and appeals to the

Board of Appeals under chapter 12 of this title involve findings of fact. Appeals to the United States Court of Customs and Patent Appeals shall be governed by the scope of review provided in section 706 of title 5 United States Code, without trial de novo. In civil actions calling into question the validity of findings of facts by the Patent Office such findings shall not be set aside unless clearly erroneous.

"(b) In any civil action in a Federal Court in which the validity or scope of a claim of a patent is drawn into question, the owner of the patent, as shown by the records of the Patent Office, shall have the unconditional right to intervene to defend the validity or scope of such claim and any party to such action may obtain evidence of knowledge of prior art pertinent thereto in the possession of any person subject to service of process of any court of the United States. The party questioning validity or scope of the claim must serve upon the patent owner a copy of the earliest pleading raising such question. If the owner cannot be personally served in the exercise of reasonable diligence, service may be made in any manner provided for in the Federal Rules of Civil Procedure and, in addition, notice shall be transmitted to the Patent Office and published in the Official Gazette.

"(c) In any action as set forth in subsection (b) of this section, a final adjudication, from which no appeal has been or can be taken, delimiting the scope of the claim or holding it to be invalid, shall constitute an estoppel against the patentee, and those in privity with him, in any subsequent Federal action, and may constitute an estoppel in such other Federal actions as the court in which they are pending may determine, involving such patent. Within thirty days of such adjudication the clerk of the court shall transmit notice thereof to the Commissioner, who shall place the same in the public records of the Patent Office pertaining to such patent, and endorse notice on all copies of the patent thereafter distributed by the Patent Office that the patent is subject to such adjudication.

"(d) In any action as set forth in subsection (b) of this section, upon a final adjudication from which no appeal has been or can be taken that a claim of the patent is invalid, the court may order cancellation of such claim from the patent. Such order shall be included in the notice to the Commissioner specified in subsection (c) of this section, and the notice of cancellation of a claim shall be published by the Commissioner and endorsed on all copies of the patent thereafter distributed by the Patent Office.

"CHAPTER 29.—PRESERVATION OF OTHER RIGHTS

"Sec.

"301. Preservation of other rights; non-preemption.

"§301. *Preservation of other rights; non-preemption*

"This title shall not be construed to preempt or otherwise affect in any manner rights or obligations not expressly arising by operation of this title whether arising by operation of State or Federal law of contracts, of confidential or proprietary information, of trade secrets, of unfair competition, or of other nature.

"Transitional and Supplementary Provisions

"Sec. 2. If any provision of title 35, Patents, United States Code, as amended by this Act, or any other provision of this Act, is declared unconstitutional or is held invalid, the validity of the remaining provisions shall not be affected.

"Sec. 3. (a) This Act shall take effect on the day six months after enactment.

"(b) Applications for patent actually filed in the United States prior to the effective date of this Act shall continue to be governed by the provisions of title 35 in effect immediately prior to the effective date, except that any such application still pending eighteen months after its filing date or effective filing date may be laid open for public inspection and published by the Commissioner in accordance with the provisions of section 120 of title 35 as enacted by this Act.

"(c) Complete applications for patent actually filed in the United States within one year after the effective date of this Act and not relying on a prior preliminary application shall continue to be governed by the provisions of chapter 10, and by the provisions relating to interferences in chapters 12 and 13, of title 35 in effect immediately prior to the effective date.

"(d) Assistant commissioners of patents and examiners-in-chief in office on the effective date of this Act shall continue in office under and in accordance with their then existing appointments.

"(e) The amendment of title 35, United States Code, by this Act, shall not affect any rights or liabilities existing under title 35 in effect immediately prior to the effective date of this Act.

"(f) Notwithstanding any other provision of this Act, subsection (d) of section 112 of title 35 as amended by this Act shall not apply to patents issued, and applications filed, prior to the effective date of this Act. No such application shall be held incomplete, and no such patent shall be held invalid, because availability to the public of a deposit of a microorganism recited therein was conditioned upon issuance of a United States patent reciting a deposit of said microorganism.

"Sec. 5. Nothing in title 35 as amended by this Act shall affect any provision of the Atomic Energy Act of 1954 (Aug. 30, 1954, ch. 1073, 68 Stat. 919) as amended or of the National Aeronautics and Space Act (Pub. L. 85-568, July 29, 1958, 72 Stat. 426) except that the functions of a Board of Patent Interferences specified in said Acts may be performed by the Board of Appeals as specified in section 7 of title 35 as amended by this Act.

"Sec. 6. The Clean Air Amendments Act of 1970 is amended by striking out section 308 and inserting in lieu thereof the following:

"If the Administrator determines that the implementation of the purposes and intent of this Act is being significantly retarded by any section of title 35 of the United States Code he shall, after consultation with the Department of Commerce, recommend to the Congress such modification of title 35, as may be necessary.

"Sec. 7. This Act may be cited as "The Patent Act of 1973."

NATIONAL ASSOCIATION OF PLANT PATENT OWNERS.

Washington, D.C., September 17, 1973.

HON. JOHN L. MCCLELLAN.

Chairman, Subcommittee on Patents, Trademarks and Copyrights, Committee on the Judiciary, U.S. Senate, Washington, D.C.

DEAR SENATOR MCCLELLAN: The National Association of Plant Patent Owners is a trade association representing members and businesses to whom plant patents have been granted.

A committee of our Association has spent nearly two years studying the portions of the patent laws governing the grant of plant patents. As the result, we have concluded that a minor change in Section 161 and the addition of a new Section 165 would clarify and strengthen these laws and promote their objectives.

Our members hope that these changes can be considered by your Subcommittee during the hearings and review of S. 1321.

The changes we recommend read:

Section 161.—Delete the words "or a plant found in an uncultivated state." Section 161 would then read as follows:

"Whoever invents or discovers and asexually reproduces a distinct and new variety of plant, including cultivated sports, mutants, hybrids and newly found seedlings, other than a tuber propagated plant, may obtain a patent therefor subject to the conditions and requirements of this title.

"The provisions of this title relating to patents for inventions shall apply to patents for plants, except as otherwise provided."

The deletion of the words "or a plant found in an uncultivated state" will eliminate the need for deciding what constitutes an "uncultivated state." For example, a knowledgeable person might find a wild blackberry plant on a river bank, with berries three times larger than normal. Because of his knowledge, he recognizes that this is a superior plant deserving of commercial propagation. He could, under present law, obtain a plant patent only by failing to make full disclosure of where the plant was found, which he would be sorely tempted to do and which might well be undetected in any litigation over a patent for this blackberry plant. Under our proposed change, he could obtain a plant patent just as if he found the plant in his back yard. In short, the change removes the temptation for dishonesty and promotes the incentives of the patent system to make public new botanic discoveries.

The other recommended change is the addition of a new Section 165 which reads:

165 Certificate of Plant Variety Protection.

a. For purposes of Section 102 (d) of this title, a certificate of plant variety protection or any grant of exclusive rights in a new plant variety of foreign country shall have the same effect as a patent granted by that country.

b. An application in a foreign country for a certificate of plant variety protection or the grant of exclusive rights in a new plant variety shall have the same effect for the purpose of a right of priority under Section 119 of this title as an application for patent in that country, provided the conditions and requirements of Section 119 for applications for patent are complied with.

Public Law 92-358 of July 28, 1972 grants, under certain circumstances, rights of priority to a U.S. patent application based on an earlier filed application for an inventor's certificate in a foreign country. It further provides, under certain circumstances, that an inventor's certificate becomes a statutory bar to the grant of a U.S. Patent. This law was designed to carry into effect provisions of the Stockholm revision of the Paris Convention for the Protection of Industrial Property of 1883 to which we will shortly be bound.

The ratification by the United States recognizes an inventor's certificate as a right tantamount to the grant of a patent. Most foreign countries rather than providing patent protection for plants, have Breeder's Rights or Plant Variety Protection Laws which grant rights in the same manner as patents. In many of these countries, one who has filed for a plant patent in the United States, by virtue of the filing can establish his right of priority under the Breeders Rights or Plant Variety Protection Laws. On the other hand, one who has filed or obtained an exclusive right under Breeders Rights or Plant Variety Protection Laws in foreign countries cannot use that as a basis for a right of priority under U.S. Law—an anomalous situation.

Proposed Section 165 would accord a certificate of plant variety protection or any similar grant of exclusive rights in a plant the same treatment as a patent grant by the country under Sections 102 (d) and 119 of Title 35.

The National Association of Plant Patent Owners strongly recommends adoption of the foregoing changes to the patent laws.

Sincerely,

L. J. DONAHUE, *Administrator.*

THE NEW YORK PATENT LAW ASSOCIATION,

New York, N.Y., September 11, 1973.

Re Written statement of the position of the New York Patent Law Association on selected portions of the Patent Reform Act of 1973 (S.1321).

HON. JOHN L. McCLELLAN

Chairman, Subcommittee on Patents, Trademarks and Copyrights, U.S. Senate, Senate Office Building, Washington, D.C.

DEAR SENATOR McCLELLAN: The New York Patent Law Association is a professional organization for patent attorneys practicing this legal specialty in the New York metropolitan area. The Association has served the interests of the public and the bar in this field since 1922. The Association, moreover, has a membership of about 1200 patent attorneys. This membership represents most of the patent attorneys engaged in practice in New York City and the surrounding New York, New Jersey and Connecticut areas.

By letter dated August 6, 1973 the Chief Counsel of the Subcommittee on Patents, Trademarks and Copyrights of the United States Senate invited the New York Patent Law Association to submit a report on its position concerning selected portions of The Patent Reform Act of 1973 (S.1321) (hereinafter called the "Hart Bill"). The New York Patent Law Association is grateful for the invitation to comment on the Hart Bill and this letter is respectfully submitted in that connection.

The Hart Bill was closely examined by the New York Patent Law Association through its Subcommittee on Patent Law Revision and this letter represents the position of the Association regarding the Hart Bill.

Our patent system has remained basically unchanged since 1836. It has been reviewed, examined and re-examined several times by presidential commissions, such as the TNEC Hearings of 1938-41; the National Patent Planning

Commission, c. 1945; The Attorney General's Committee to Study the Antitrust Laws (Report, March 31, 1955); and The Report of the President's Commission on the Patent System (1966). The patent system has been reconfirmed as beneficial to the public and a just reward for inventive contributions to the useful arts. As most recently reported by the Presidential Commission of 1966:

"The members of the Commission unanimously agreed that a patent system today is capable of continuing to provide an incentive to research, development and innovation. They have discovered no practical substitute for the unique service it renders."

This remarkable stability of the patent system is not due to industry's, private inventors' or the patent bars' resistance to change. Rather it results from the foresight of our Founding Fathers in recognizing and applying the simple logic that persons invent and disclose their inventions, and entrepreneurs commit the necessary capital to bring these inventions to the public, only where there is an adequate incentive to do so. Quoting further from the Presidential Commission:

"First, a patent system provides an incentive to invent by offering the possibility of reward to the inventor and to those who support him. This prospect encourages the expenditure of time and private risk capital in research and development efforts.

Second, and complementary to the first, a patent system stimulates the investment of additional capital needed for the further development and marketing of the invention. In return, the patent owner is given the right, for a limited period, to exclude others from making, using, or selling the invented product or process.

Third, by affording protection, a patent system encourages early public disclosure of technological information, some of which might otherwise be kept secret. Early disclosure reduces the likelihood of duplication of effort by others and provides a basis for further advances in the technology involved.

Fourth, a patent system promotes the beneficial exchange of products, services, and technological information across national boundaries by providing protection for industrial property of foreign nationals."

We are seriously concerned that the proposed Hart Bill would work against these purposes of the patent system. The total effect of the bill would be so burdensome on inventors and developed of inventive technology as to destroy their incentive to invent and/or force them to elect secrecy rather than public disclosure under the patent system. It would discourage them from investing the capital necessary for developing and bringing new products to the public. In short, the progress of the useful arts would be inhibited rather than promoted.

This report will now address itself to the specific subjects listed in the Chief Counsel's letter of August 7, 1973.

1. Modification of Patent Examination Proceedings to Provide Public Adversary Hearings

The provisions of the Hart Bill establishing adversary proceedings are Section 122 which requires the Commissioner to make all applications available for public inspection and copying within six months of filing, and Section 135 which permits any party between such publication and allowance to intervene with any information which might have a bearing on the patentability of the application. The term "party" includes the Public Counsel (discussed below), any agency, state, political subdivision, or instrumentality thereof, and any person adversely affected by any action of the Patent Office under Section 100(b). The intervening party may identify himself and participate in further proceedings, or remain unidentified under Section 135(d).

What is contemplated is an open ended, unlimited, pre-issuance patent opposition proceeding in which the opponent (or opponents) need not even be identified.

Past proposals for pre-issuance opposition proceedings have consistently been disapproved. This disapproval usually centered on the increased operating costs in the Patent Office from two separate publications for each application, and increased cost and interminable delay to the applicant. Pre-issuance opposition would also deprive the inventor of his right to know the scope of his patent before being obliged to surrender his right to keep his invention secret.

The consequence of such opposition proceedings is not only a decrease in inventor's rights, but also the probable disuse of the patent system to the detriment of the public and the progress of the useful arts.

The Hart Bill is subject to all of these objections to earlier opposition proposals and adds some shortcomings of its own. The twelve-year patent term from the date of filing provided by Section 153(b) without a saving clause in case of opposition proceedings, together with the provision of Section 271(a) limiting infringements to activity occurring only after issuance, subjects an inventor to a shortened and, in the event of a protracted opposition, possibly no effective patent life at all.

In addition, since the proposed Section 102(a) follows a universal prior art approach and no longer limits prior art to publicly available printed documentary evidence (or public uses), an opposition could be based upon prior knowledge or use anywhere in the world, even if the use was secret. Thus, an inventor could be denied his rights notwithstanding the fact that he is the first to provide in this country what is now recognized as the *quid pro quo* entitling him to a patent, namely, the disclosure of the invention to the public.

The proposed opposition proceedings would be conducted by a Primary Examiner. The Examiner's decision would be appealable to the Board of Appeals under Section 134(a), and appeal could be initiated by any party (as that term is defined above) under Section 137. Furthermore, under Section 134(c) the appeal could be conducted as a *de novo* proceeding with any party introducing new evidence not previously in the record. The potential burdens on the applicant, as well as on the Patent Office, are staggering. Also, it is questioned whether a Primary Examiner should be called upon to receive, supervise and analyze testimony in adversary proceedings (as would be necessary on public use proceedings) and to make decisions based thereon. *De novo* proceedings on appeal could lead to abuse in that an opposer could withhold art from the Examiner on the basis that he could always introduce it on appeal.

In preference to the pre-issuance adversary proceedings proposed in the Hart Bill, we would recommend a post-issuance revocation procedure. This type of proceeding would not destroy the present trade secrecy rights of an inventor. He could maintain his invention secret during pendency of his application. The costs on the Patent Office and the patentee would be far less. In addition, this proceeding would not shorten the effective life of the patent, as would the adversary proceedings under the Hart Bill.

Accordingly, we feel that the adversary proceedings provided in the Hart Bill would seriously discourage inventors from using our patent system. Assuming the purpose of these provisions to be the improvement of the quality and reliability of issued patents, we believe that post-issuance revocation proceedings are a far better means for accomplishing this purpose.

2. *Creation of Office of Public Counsel*

The Hart Bill (Section 3(d)) establishes the position of Public Counsel who shall be appointed by the President with public approval; and he shall be "independent of the Commissioner in carrying out his responsibilities." In addition to the duties now assumed by the Solicitor, the Public Counsel is delegated the responsibility of assuring the issuance of "high quality patents" by reviewing "all proceedings in the Patent Office." He "may intervene and participate at any time in any Patent Office proceeding" where he believes developing law or technology or the public interest warrants such intervention. In order to carry out the purpose of the proposed statute, the Public Counsel, at his discretion, may take any action, participate in any other proceeding, or conduct any investigations or inquiries he deems appropriate.

He would have power under Section 24 to subpoena "any applicant, patentee, or any other person within the jurisdiction of the United States . . . to appear . . . to testify, produce documentary evidence, or produce other information or material . . . or file reports or answers in writing to specific questions." Under Section 132 he could be called upon by the Primary Examiner to "intervene and participate in any proceeding". He would brief and argue appeals to the Board of Appeals under Section 134a and to the Court of Customs and Patent Appeals under Section 143, and to the District Court for the District of Columbia under Section 145.

In our view, this section should be opposed because of the anticipated high costs of implementation which would inevitably result in escalation of patent fees and the broadness of the powers granted the Public Counsel. We have difficulty in reconciling the anomalous and inconsistent situation of having the Public Counsel represent the Patent Office in the defense of appeals from final actions, while in the same breath being virtually independent of the Commissioner or Patent Office policy. It is feared that his autonomy and uncontrolled power could be potentially more harmful than beneficial to the patent system.

3. Establishment of a System for Deferred Examination of Patent Applications

The 1966 President's Commission on the Patent System adopted as one of its recommendations the proposal that enabling legislation be enacted to permit the Commissioner of Patents to establish a deferred examination program if he deemed it desirable. This was coupled with a recommendation for the publication of each application within an 18 to 24-month period after its effective filing date. (Cf. the Hart Bill proposal of 6 months.)

In 1966 the average pendency period between filing an application and issuing a patent thereon was two and one half years and rising. Likewise, the patent application backlog was rising. The Commission's purpose in recommending the publication of applications was to provide the public with knowledge of the advancements in technology more rapidly than the Patent Office was then doing it. The deferral of examinations was believed to be a possible solution to relieving the Patent Office of some of its work since some applications would be abandoned and would never require examination.

Since that time the average pendency time has been reduced to 24 months. As former Commissioner Gottschalk reported in May of this year, "Pendency time is now at the lowest level in over 50 years." (APLA April-May '73 Bulletin, p. 262) He also reported that the application backlog is going down, and that the Office's rate of disposals is exceeding the new filings by 12,000 applications per year.

With this present average period of pendency of two years, the publication of applications for the purpose of early disclosure is no longer necessary. Likewise, in view of the more rapid disposal of cases, the need to lighten the workload of the Patent Office (one of the objects of deferred examination) is not urgent today as it might have been in 1966.

It is also not known whether the number of applications that will be abandoned during the deferred period, if any, will be significant. The investment an applicant makes in filing is not limited to the Patent Office fees. He must also pay for the services of an attorney or agent and generally, as a result, the total expenditures for filing become substantial. Having made the decision to file despite the required initial investment, it is not likely that very many applications will be abandoned without at least receiving a first examination to determine possible patentability.

Section 192(b) of the Hart Bill, providing for the examination of deferred applications, permits any party (as defined above) to request examination by paying a so-called basic examination fee. The applicant would then be required to pay all other fees. The amount of this basic fee is not set forth, but it is assumed that it would be nominal. It is also not definite whether an applicant may refuse to pay all other fees subject to his application being declared abandoned, but this "relief" would appear to be available. In any event, it would appear that this provision lends itself to abuse by parties who, by paying a nominal fee, could force an applicant, at best, to pay the remainder of an examination fee when he was not prepared to or, at worst, to abandon his application.

A pre-issuance publication procedure would be necessary to implement a deferred examination system if delayed disclosures are to be avoided. Reasons for opposing such publication are discussed elsewhere in this report. These reasons alone are sufficient basis for opposing the deferred examination proposal.

This Association opposes the deferred examination system proposed by the Hart Bill. The seemingly insignificant benefits that might be derived from such a system are far outweighed by the disadvantages that would result from both it and the publication of applications.

Thus, it is our view that deferred examination is unnecessary in view of the Patent Office's current pendency and backlog status, unfair to the applicant in that it would require pre-issuance publication, and unwise in that the hoped for benefits of fewer examinations are illusory.

4. Patent Office Fees

The critical provisions of Section 41 that depart from existing law are summarized as follows:

(a) Fees shall be designed to affect an overall recovery in the range of 65-75 per centum of the costs of operation of the Patent Office (Section 41(b)(1)); and

(b) Maintenance fees are established to maintain a patent in force. Individual inventors and small businessmen may be granted exemptions under certain circumstances. (Section 41(b)(2))

(c) Beginning with the fourth year after a patent issues, the maintenance fees shall be no less than \$1000 and shall increase annually by at least 25 per centum each year. Deferred payment of such maintenance fees are sanctioned provided certain prerequisites are met. (Section 41(c))

We oppose this section. The 65-75 percent cost recovery rate is far too high in view of the Office's current and projected operating costs, and also because it ignores both the public interest served by the patent system, as well as the tax revenues derived from that system. We also question the fairness of the proposed fee system in that one of the effects would be that corporations would disproportionately subsidize a major part of the patent system. And, finally, the escalation rate of maintenance fees and the relatively high minimum fee established appear to be designed (1) to punish patent owners who are not working their patents, and (2) place a large percentage of issued patents in the public domain before they have realized their commercial potential.

This is contrary, in our view, to the basic spirit of the Constitution (Article 1, Sec. 8)

We favor the continuation of statutory fees subject to periodical Congressional review.

5. Administrative Restructuring of the Patent Office

Section 2 of the Hart Bill establishes the Patent Office as an "independent agency".

We favor granting independence of action to the Patent Office and it is our understanding that there are presently separate bills in the Senate which would accomplish this.

In addition to the specific subjects we have discussed above and which were referred to in the Chief Counsel's letter of August 7, 1973, the Association's Subcommittee on Patent Law Revision has also examined other points in the Hart Bill and the Association's position on these other points will be submitted to you in due course.

If I can give you any further information or material relating to the above, please let me know.

Respectfully submitted,

JOSEPH J. PREVITO, *President.*

THE NEW YORK PATENT LAW ASSOCIATION,

New York, N.Y., September 30, 1973.

Re Written statement of the position of the New York Patent Law Association on additional portions of the Patent Reform Act of 1973 (S. 1321).

Hon. JOHN L. McCLELLAN,

Chairman, Subcommittee on Patents, Trademarks and Copyrights, U.S. Senate, Senate Office Building, Washington, D.C.

DEAR SENATOR McCLELLAN: This supplements our letter to you of September 11, 1973. In our September 11, 1973 letter, we remarked on five specific subjects concerning the so-called Hart Bill and we indicated that we would submit our Association's position on other points of the Hart Bill at a later date. This letter represents our Association's position on the other points set forth in the Hart Bill which we did not comment on in our letter of September 11, 1973.

Section 102. Conditions for patentability; novelty and bars to patent.—The introductory phrase is a change from present law in that it states that a person shall not be entitled to a patent if the subject matter sought to be patented encounters any of the obstacles recited in the section, as contrasted to the present law which states that the applicant shall be entitled to a patent unless certain stated conditions are encountered. This change shifts to the

applicant the burden of going forward with evidence of absence of anticipation or lack of obviousness. This change should be considered together with the new proposed Section 140 "Burden of Persuasion", which states that the applicant shall have the burden of persuading the Office that a claim is patentable.

It is far too burdensome, indeed practically impossible, for an applicant to prove the absence of all of the conditions set forth in Section 102. This requires the proof of a negative. Under the Hart Bill the Examiner could merely say under Section 140 "you have failed to persuade me that the claim is patentable" because you (the applicant) have failed to show that there is no prior publication, public knowledge, public use, etc.

The effect of the proposed change in Section 102 should also be considered together with Section 1 of the Hart Bill. Section 1 purports to state the national policy to be "to promote the progress of science and the useful arts, by granting inventors the privilege, for a limited time . . . to exclude others . . ." (Emphasis added) But Article I, Sec. 8 of the Constitution speaks in terms of granting inventors "the exclusive right", and the Courts have so construed the patent grant. The distinction is subtle but significant in that privileges can and frequently are set aside in the face of countervailing equities.

Thus, Sections 102 and 140 as proposed would place an intolerable burden on the applicant in obtaining a patent, and Section 1 would then undercut the value of that patent once obtained.

Sections 102(a) and 102(b) would change the present law by permitting the use of universal prior art to defeat a patent, i.e. prior knowledge, public use or placing on sale in a foreign country. This has been debated (and defeated) before. It would place an undue burden on the applicant because it would require him to explore activities of others in foreign countries without assurance of the assistance of service of process or the right of full and complete cross-examination, which he would have with regard to similar activities in the United States. It would also make virtually impossible a reliable validity search as a basis for investment in the invention, and it would make patent validity adjudication even more expensive than it already is.

Section 102(a) and 102(b) would also change the present law in adding to the subject matter which can defeat a patent application, subject matter which is "described in printed or other tangible form in this or a foreign country". This would abandon the well-founded reliance on our law on patents, publications, which are ascertainable with reasonable certainty, and those matters in the prior art which are accessible to the public, a the principal measures of the information available to the American public. Instead, it would include within prior art all writings, whether handwritten, and whether published or secret. Thus, as literally construed, laboratory notebooks maintained in secrecy in research laboratories, patent applications filed in foreign countries and maintained in secrecy, even those abandoned, would be prior art which could defeat an application for patent. One could never be sure, even at the point of litigation, that somewhere in the world there would be uncovered a secret document never before known by anyone except its author, that would render the litigated patent invalid.

Section 102(c) states that a patent is to be refused if the subject matter, "was forfeited, suppressed, or concealed". The present law [Section 102(c)] states that the applicant is to be refused the patent if he has abandoned his invention.

The intended effect of the proposed change is unclear. There is no definition of the terms "forfeited", "suppressed" or "concealed". Consider the quite common situation where the inventor spends time bringing an invention to the point of commercialization, during which time close secrecy is maintained. This might be considered "suppressing" or "concealing" the invention so as to defeat the right to a patent under the proposed Section 102(c). Moreover, the section makes no allowance for situations where the applicant resumes activity after a period of inactivity or secrecy. In such situations the applicant should not be denied his right to a patent.

Section 102(e) would change the present law by making the effective date of a United States patent, for prior art purposes, the filing date of a corresponding foreign application under Section 119, rather than the actual filing date in the United States as under present law. The language of the paragraph is somewhat unclear in that it does not state whether the U.S. application shall be entitled to the foreign date only for the subject matter which appeared in

the foreign application and which was carried forward in the corresponding U.S. application. We seriously doubt the wisdom of this change in the law preferring the contra rationale of the CCPA and the Court of Appeals for the District of Columbia in *In re Hilmer et al.*, 149 USPQ 480 CCPA, 1966 and *Eli Lilly and Company v. Brenner, Com. Pats.*, 153 USPQ 95, DC Cir. 1967.

Section 103. "Conditions for patentability; non-obvious subject matter".—The word "identically" appearing in line 2 of the present law has been omitted in the Hart Bill. The reason for the omission is not clear, although it may be an attempt to codify cases decided since the enactment of the 1952 Act, e.g. in *In re Foster*, 145 USPQ 166.

More significant, however, is the omission of the last sentence of Section 103 of the present law "Patentability shall not be negated by the manner in which the invention was made." This sentence was included in the present law to overrule the holding of *Ono Engineering Corporation v. The Automatic Devices Corporation*, 51 USPQ 272, U.S. Supreme Court, 1941 which held that one of the criteria for invention was a "flash of genius". Since deletion of the quoted sentence could adversely change the criteria for patentability, the proposed change is opposed.

Present section 104.—This section of the present law entitled, "Inventions made abroad" has been deleted in the Hart Bill. This section prevents the use of knowledge or use in foreign countries, in establishing the date of invention. Section 104 of the present law should be retained. Otherwise it would place the same intolerable burdens on United States applicants as those discussed above in Sections 102(a) and (b), namely, undue hardship in proving or disproving the activities of others in foreign countries without the assurance of the right of service of process or cross-examination.

Section 104(a). Date of invention; priority.—This section precludes an applicant from reliance upon a date of invention more than one year prior to his filing date or, in the event of a continuing application, to a date more than one year prior to the filing date of the immediately preceding parent application. This also has been debated (and defeated) before. Patents should not be issued on the basis of who won the race to the Patent Office. With respect to the one year period, it is felt that it is too short since more time is frequently needed to conduct the research necessary to ascertain the proper metes and bounds of the discovery involved and to enable the application to be prepared and filed. Furthermore the limitation of the right to rely only upon the immediately preceding parent application unduly restricts present continuation practice, discouraging the application from updating the original disclosures to disclose the best mode for commercial utilization. To the extent that continuation practice has in the past been a source of abuse in extending the period of protection for an invention, the revision in the patent term to measure the term from filing date rather than from issue date is the better alternative.

Section 104(b) purports to deal with the determination of priority of inventorship, and leaves the basis for such determination to rules and regulations to be prescribed by the Commissioner. This is in marked contrast to present law [see 35 USC 102(g)] and is undesirable a promoting uncertainty. The meaning of the language "make dispositive the respective dates of filing . . . and reduction to practice" is unknown and certainly fails to provide the necessary guidance to the Commissioner and to the public.

Section 104(d) would appear to bar an applicant from obtaining a patent upon a material that has been disclosed in the prior art even though it failed to teach how to prepare the composition and failed to disclose how to use it. In consequence, this provision would appear to countenance, indeed encourage, speculative or erroneous disclosures to bar later workers from securing protection for their discoveries. By encouraging specious disclosures such a provision would seem to be counterproductive in promoting the progress of useful arts and its enactment should be resisted. It also appears to reverse current law to the extent that it would allow reliance on inoperative disclosures as prior art.

Section 104(e) denies patentability "in the perception of a problem the solution of which is obvious". Discovery of the nature of a problem may well constitute invention. The fact that the solution may be obvious, once the problem is understood, has frequently been held to be the hallmark of truly meritorious inventions. This area of inventive activity should not be singled out and denied protection.

Section 111. Application for patent.—This section permits application for patents to be filed by an assignee, not necessarily the inventor. This change is

desirable; however, certain improvements should be made. For example, provisions should be included for correcting errors in the naming of the inventors during pendency of the application. Another is that there should be steps for inventor ratification of the agent's authority within a prescribed period of time after filing.

Section 112. Specification.—Paragraph (a) requires a great deal more in the disclosure of the specification than does the present law, particularly with regard to novel or unexpected properties and results, dates of each invention claimed, dates of reduction to practice of each claim, specific designation of best modes and of know-how known to the inventor and applicant necessary for commercial utilization. Besides the work and expense involved, these new requirements would place the applicant at a serious disadvantage with regard to possible future interferences with other parties, to have disclosed his dates of invention. Furthermore, it is not certain whether the date of invention includes the date of conception or diligence. With regard to disclosing the best mode, the inventor at the time of filing of the application may not know what the best mode is, because he has not had sufficient time to test all of variations of his invention. The requirement to disclose know-how is also burdensome. Literal compliance would require including in the application detailed engineering drawings, techniques and technologies in the published prior art but which may be important for success for commercial development.

Section 112(b), first sentence would require the applicant to state not only what is previously known but also what is obvious therefrom. This in effect requires the applicant to predict a conclusion of law which a Court might make in interpreting the patent years hence. The fourth sentence requires the applicant to give "the range of equivalents to which any element of any claim shall be accorded". Here again the law would be requiring the inventor to prophesize what the Courts and would-be infringer might do years hence with the benefit of after-acquired knowledge. This is an intolerable burden on the applicant.

Section 112(c) deals with claims directed to combinations of means. It is essentially the same as the present statute except that it deletes the final phrase "and equivalents thereof". The deletion of the phrase could be interpreted as a significant deduction from the patentee's scope of protection and therefore is objectionable.

Section 115. Oath of invention.—This provision requires a number of oaths or declarations in addition to the oath required at time of filing. These additional oaths, including those of each inventor, each applicant, if the applicant is not the inventor, and each attorney involved in the preparation or prosecution of the application, are to be submitted prior to issuance of the patent and are to recite an absence of awareness or prior public uses, prior art more pertinent than that considered by the Patent Office, and other material information. Given the present state of the fraud defense in patent litigation, the submission of these affidavits would appear to be pointless but would materially add to the cost of obtaining a patent and would significantly increase the quantity of documents to be processed within the Patent Office without commensurate benefit. The added cost and burden upon an applicant make this provision, as proposed, wholly undesirable.

Section 116 Joint inventors.—This section represents a significant departure from current law. Under this provision claims having different inventive entities may be joined in a single patent application, thereby assisting in the reduction of the number of applications to be filed to protect different aspects of a given inventive concept. This change is deemed highly desirable and its enactment is strongly recommended.

Section 120. Benefit of earlier filing date in the United States.—This section pertinent to continuation and continuation-in-part practice would appear to impose significant restrictions on such practice. For example, subsection (a) (4) (D) and (E) would bar the filing of such an application after the filing of appeal or after one year from the public availability of the subject matter disclosed in the parent application. For reasons discussed earlier (see Section 104 supra) such limitations and restrictions on the filing of continuation applications are deemed to be undesirable and counterproductive. The cutting off of the right to file a continuation application after a notice of appeal has been filed in the parent case is particularly obnoxious since an Examiner frequently fails to clearly state his bases for rejection prior to the submission of an

Examiner's Answer, by which time under this Section a continuation application could not be filed.

Section 122. Public availability, publication, and confidential status of application.—Under this provision applications, except those placed under secrecy order, are to be made publicly available within six months of the actual filing date and are to be published as soon after becoming available as possible. The publication of pending applications has long been considered, and has long been opposed, and is still opposed as being unsound. Reasons in support of such opposition can be briefly summarized as follows:

- (1) It deprives the inventor of his right to keep his invention secret.
- (2) It will encourage the submission of ill-defined and speculative disclosures which are useless as a base for building further advances, but rather which are presented largely to prevent others from obtaining patents.
- (3) It will pyramid the cost of operation of the patent system thereby reducing its use by others than the large corporation.
- (4) It will encourage filing of large numbers of specious disclosures as a means for clouding the precise area of commercial interest on the part of the applicant.
- (5) The cost of publishing all applications would be a burden on the Patent Office budget, and eventually on the applicants, who would have to foot the bill for the major portion of such cost, under Section 41(b) of the Hart Bill.

Section 131(b) of the Hart Bill requires the applicant to (1) submit prior art which the applicant has considered in connection with his patent application "the disclosure of which is necessary to make the application as a whole not misleading" and (2) provide an explanation as to why the claims of the application are patentable over cited prior art. The quoted language is unclear in scope and effect. Furthermore there should be a saving clause to the effect that neither matters of judgment exercised in citing prior art nor inadvertent failure to comply with the section would result in a holding of invalidity, unenforceability, misuse or fraud.

Section 132(e) prohibits amendments which would add claims that materially enlarge the scope of the claims of the application. This limitation apparently is due to the adversary examination feature of the Hart Bill discussed elsewhere in this report. It is in our view an unjustified curtailment of an applicant's rights.

Section 140. Burden of Persuasion.—This section places on the applicant the burden of persuading the Office that a claim is patentable. We believe the better rule is that reasonable doubts should be resolved in favor of patentability. The market place is the best means for resolving doubts. The applicants should be afforded the opportunity to prove commercial success industry acceptance, etc. to tip the balance in favor of patentability. Such factors, however, usually does not appear until long after the examination process is ended. If, as provided in Section 140 of the Hart Bill, the applicant has the burden of persuasion, he would be denied the opportunity of proving commercial success in support of unobviousness because his patent would never issue.

Section 147 provides that appeals from the CCPA shall be to the U.S. Court of Appeals for the District of Columbia and further denies Petition for Certiorari for review by the U.S. Supreme Court unless the Petition for Review by the Court of Appeals has been denied. In addition it appears that the current Section 146 interference review action in the district of the adverse party is eliminated. The effect of this section is to displace the CCPA to a level subordinate to the Court of Appeals. In our view this change is not warranted and should be opposed.

REISSUES AND DISCLAIMERS

Section 201 provides for reissues similar to the present law with the exception that it prohibits enlarging the scope of the claims of the original patent and stays the reissue application if the validity of the patent or the conduct of the patentee in procuring it is in question in any proceeding. We are opposed to the prohibition of broadened reissues for the same reason as discussed above with respect to Section 132(e).

Section 203 provides for disclaimer and is similar to the current law, but adds the feature that the disclaimer must be timely upon learning of the defect, and further that a terminal disclaimer or dedication shall have no effect in the determination if the patentability or validity of a claim in pat-

ents involving a double patenting problem. We believe that this limitation on the effect of a terminal disclaimer in a possible double patenting situation is wrong and should be opposed.

Section 288 provides that an infringement action may be brought on a patent provided the requirements of Section 203(a) are met. The effect of this is very unclear and could be severely limiting on a patentee's right. It should be compared with the current Section 288 which merely denies the patentee his costs if he fails to disclaim.

TERM OF PATENT AND STATUTE OF LIMITATION

Section 153 limits the term of a patent to twelve years from the filing date except that the term may be extended by the period of deferment of examination. We are opposed to this provision for two reasons. The period of twelve years from filing is far too short. Many inventions, particularly those frequently referred to as being "ahead of their time", would only then be coming into full commercial use. This provision is also defective in that it leaves in the hands of the applicant or third parties a degree of control over the life of a patent. Patents should be of uniform duration. We are not, however, opposed to the concept of measuring the life of a patent from its filing date, provided the term is long enough to permit development of the invention and adequate remuneration for the patentee.

Section 286 shortens the current statute of limitations from six years to two years, illustrating but another unreasonable counter-productive limitation of the patentee's rights.

RETROACTIVE LICENSE

Section 184(a) prohibits the grant of a retroactive license regardless of the circumstances. This seems unwarranted particularly in view of the current trend toward liberalization of foreign trade.

LICENSING

Section 261 changes the current law to eliminate the patentee's express right of territorial licensing. This is another unwarranted diminution of the patentee's rights.

EMPLOYEE-INVENTOR RIGHTS

Section 263 provides for a minimum of two percent of the profit or savings to the employer as necessary consideration for any assignment from the employee to employer. This minimum appears to be an arbitrary amount unrelated to the status of the employee, the complexity of the invention, or the contribution of the employee to the invention. The determination of such a percentage for a complex system including numerous inventions would present an accounting problem impossible of practicable solution. This is a matter which is better left to private contract.

We trust that our comments in connection with the Hart Bill both in this letter and in our previous letter to you of September 11, 1973 will be helpful to your subcommittee in this very important field letter.

If we can be of further service to you in this connection, please let me know.

Respectfully submitted,

JOSEPH J. PREVITO, *President.*

SUPPLEMENTAL STATEMENT OF JOHN J. PEDERSON CONCERNING S. 1321

The following comments supplementing my statement presented Tuesday, September 11, 1973, are in specific response to positions taken and statements made by other witnesses, namely, Messrs. Dann, Schuyler, Irons, Brenner and Hogan, on the subjects included in the hearing agenda.

ADVERSARY PROCEEDINGS

A. A major objection raised by several witnesses to S.1321 is the requirement for publication prior to detailed ex parte examination proceedings. The belief that, as a matter of fairness if not due process, the inventor is entitled

to at least a *prima facie* determination of patentability before having to make a decision as to whether to publish his invention or to keep it as a trade secret bears reexamination in view of the Subcommittee's questions. Although this proposition has been so widely held in the patent profession as to be considered axiomatic, and although I personally was of that conviction as recently as the time of my principal statement and testimony, I now believe that it is not well-founded. There is nothing inherently inequitable or unfair about making early publication a condition of eligibility for the privilege of receiving a patent grant.

Moreover, the choice between accepting a patent and retaining the subject matter as a trade secret is not available, as a practical matter, in the majority of cases, assuming that the inventor or his assignee wishes to realize any profit or other commercial benefit from the invention. In the ordinary case, the innovative advance is ascertainable by analysis of the commercial product in which it is used, and as soon as the proprietor puts such a product on the market the cat is let out of the bag. Accordingly, there is no real choice except in those rare cases, like the formula for Coca-Cola syrup, which defy identification by product analysis. I estimate that the prospect of maintaining a commercially useful innovation as a trade secret for any substantial length of time exists in well under 10% of the cases; outside the chemical field, the trade secret option is practically nonexistent.

Although not inequitable or unfair, however, it may be unwise to establish an immediate publication requirement. So long as applications are preserved in secrecy during their pendency, or at least for a substantial period of time such as 18 months after filing, most corporations (who constitute the real parties in interest in more than three out of every four applications filed) can, and many do, file patent applications soon after conception without prematurely revealing development programs or product plans. Improvements will be made the subject of additional applications filed as the improvements are made. However, under a system providing for publication of patent applications promptly after filing, it is to be expected that on the basis of fundamental competitive considerations, many applications would be held back until completion of development and final preparations for commercial use.

B. It has been argued that early publication would clutter the library of prior art with some 35,000 applications abandoned each year which contain nothing innovative. This argument is manifestly inconsistent with the asserted need to preserve the inventor's right to choose between accepting the patent or maintain the invention as a trade secret. Not all of the 35,000 abandoned applications each year are abandoned because they contain only subject matter which is old or disclosed elsewhere. Many are abandoned because the scope of those claims held to be allowable by the Patent Office Examiner is thought to be too narrow to justify the payment of issue fees and printing fees. Others are dropped on economic considerations alone, whereas still others must be presumed to have been dropped, despite the allowability of some claims, on the determination that the trade secret option is more attractive.

C. In defense of the propriety of the standards of patentability followed by the Patent Office, it has been stated that the percentage of applications filed which proceed to grant has held steady at approximately 70% for many years. This fact is not probative of the adequacy of patentability standards. The quality of issued patents is measured, not by their numbers or by the percentage of applications filed, but by the adequacy of the claims of the patents which do issue to satisfy the statutory criteria for patentability. This crucial factor is not reflected in any statistics.

D. Adversary proceedings have been criticized on the basis that they can be used to delay the patent grant and thus deprive the patentee of a substantial portion of the patent term. This objection has been overcome in foreign countries having opposition proceedings by provisions for the assessability of damages for past infringement in cases surviving the opposition practice.

DEFERRED EXAMINATION

A. It has been stated that publication in advance of an *ex parte* patentability determination is undesirable. In addition to the responses enumerated to this objection under the caption "Adversary Proceedings" above, it can be pointed out that the provision of a deferred examination option is beneficial to

the applicant as well as to the Patent Office and the public, and that there is nothing requiring the applicant to avail himself of the deferred examination option if he does not want the immediate publication that that would entail.

B. It is stated that deferred examination practice yields uncertainty over a prolonged period of time as to the scope of ultimately issuing patent claims. This is true, of course, but the monopoly grant only commences with a finding of allowable claims and the delay in reaching any such finding is a benefit to the public in precluding infringement charges for commercial activity of others during the deferral term. Moreover, if this is thought to be a serious concern, it would be a simple matter to provide for intervening rights to protect those who undertake commercial practice of the invention while the application is in a deferred condition.

C. It is stated that deferred examination has only been adopted abroad in countries faced with emergency backlogs, as an expedient to permit backlog reduction, and that we do not face such emergency conditions here. This argument is obviously non-responsive. The premise can be conceded without compelling the conclusion. Whatever the motivation for adoption of a deferred examination practice in other countries, it can be used here as a means of eliminating wheel-spinning in the Patent Office, which is an obviously desirable objective.

MAINTENANCE FEES

A. It has been argued in support of maintenance fees that they can be used to prevent further increases in filing or issue fees while maintaining a recovery of the desired 65 to 75 percent of Patent Office operating costs. It should be pointed out, however, that the filing and issue fees now, as in the past constitute a small part of an applicant's expense in applying for and securing a patent. At Zenith Radio Corporation, the average cost of obtaining a U.S. patent is some several thousands of dollars, represented primarily by professional staff time and overhead; government fees are a small part of the cost. Even an independent inventor with a simple invention will necessarily be subjected to attorney's fees several, if not many, times greater than the government filing and issue fees; the average billing rate of patent attorneys in accordance with a recent APLA survey is in excess of \$40.00 an hour, and even the simplest application will require a day or two of an attorney's time at those rates. Additional attorney's fees are typically incurred in connection with responses to Patent Office objections. Accordingly, filing and issue fees are not a significant determining factor in the decision to file or not to file a patent application, and they can bear substantial and even severalfold increases without becoming such a factor.

B. There is a consideration which could possibly be urged to support the institution of maintenance fees. At the present time, among all of the major countries of the world, only the United States and Canada have patent systems in which maintenance fees are not required at some time or times during the life of the patent. This state of affairs places American companies at a competitive disadvantage with foreign companies in the same industry. More particularly, our foreign competitors can acquire and maintain extensive patent portfolios in the United States (our home market) without incurring continuing maintenance fee burdens. U.S. patents are relatively inexpensive in this respect. However, American companies wishing to maintain patent portfolios in the home countries of their foreign competitors find that as a practical matter they must be much more selective in view of the continuing expense represented by maintenance fees. If the imposition of maintenance fees is to become a part of the U.S. system, I believe that this constitutes better justification for that change than any heretofore advanced.

PUBLIC COUNSEL

The public counsel provisions of S.1321 have been opposed on the basis that the establishment of a Public Counsel's office would be impractical or unduly expensive. It is suggested that it would be better to use the same monetary appropriation or some part of it to strengthen and improve the present ex parte procedure by enlarging the examining corps and by other measures. The simple answer to this position is that the money would not be used, that an ex parte procedure, no matter how strengthened, would still suffer from the

shortcomings, developed in my initial statement, and that improved patent quality cannot be expected to come without additional cost. Moreover, institution of the Office of Public Counsel can reasonably be expected to result in an increase in the standards of patentability as established by the Patent Office interpretation of the statutory requirements for unobviousness (Section 103), and after an interim transition period, it is to be expected that the number of trivial or marginal applications which are filed will be greatly diminished, thus reducing the examining burden on the Patent Office. Finally, the added cost burden of the Public Counsel's office will be offset, at least in large measure, by the cost savings effected through deferred examination practice.

CONCLUSION

In closing, I wish to repeat my initial observation that S.1321 constitutes a bold and imaginative approach to the urgently needed patent reform. Any bill deserving of the name of patent reform will require major changes in the practice, and it will be incumbent upon the patent bar to adapt to such changes. I am confident that, with appropriate revisions, S.1321 will serve the intended purpose of strengthening the patent system to better serve the basic constitutional objective of promoting progress in science and the useful arts.

JOHN J. PEDERSON.

PHARMACEUTICAL MANUFACTURERS ASSOCIATION,
Washington, D.C., September 27, 1973.

Hon. JOHN L. McCLELLAN,
Chairman,
Subcommittee on Patents, Trademarks and Copyrights,
Dirksen Senate Office Building,
Washington, D.C.

DEAR SENATOR McCLELLAN: The Pharmaceutical Manufacturers Association submits the following comments on S.1321, for the General Reform and Revision of the Patent Laws, introduced by Senator Hart on March 22, 1973 and referred to the Committee on the Judiciary.

The PMA is a voluntary, non-profit membership association composed of 112 companies engaging in the development and production of prescription and ethically promoted over-the-counter drugs. PMA member companies regularly seek protection of the results of their extensive research for new therapeutic agents through the United States patent system and are therefore concerned that it continue to provide adequate incentives to stimulate such research and thereby benefit the public.

Our comments are limited to subsections 100(g), 114(c), 122(a), 153(b) and section 273 of S.1321. Enactment of these provisions would have a direct and substantial adverse effect on both the type and scope of patent protection for pharmaceutical products and processes.

SUBSECTION 100(g)

Subsection 100(g) would create a statutory definition of the terms "manufacture, composition of matter, and new and useful improvement thereof" so as not to include any known manufacture or composition of matter, any obvious variation thereof, or any conventional formulation or preparation of any of the foregoing or of any material, whether or not the same is adapted for practicing a new use thereof. Subsection 100(g) apparently is intended to modify current law regarding the patentability of compositions of matter. If subsection 100(g) is intended simply to codify present law, in our view, the language is confusing and somewhat contradictory. In any event it is a negative definition which is unnecessary and redundant in view of the present state of the law. Further, if this section is intended as a codification of current law, the legislative history should clearly reflect this fact.

Under present law, a patent may be obtained on a new, unobvious and useful machine, manufacture, composition of matter, or new and useful improvement thereof. A patent may not be obtained on a *known* machine, manufacture or composition of matter, or improvement thereof, even if a new use advantage or property has been discovered. The inventor of a new use for a

previously known compound may obtain patent protection for the new use of the known compound. In addition, in accordance with well established and well reasoned case law, a use or advantage or property may be considered in determining whether a new machine, manufacture or composition of matter is non-obvious under section 103 of the patent law.

Thus, if a compound, machine or manufacture differs in some way from those of the prior art, one may argue its patentability by pointing to the uses, advantages or properties to which the new compound, machine or manufacture may be applied to demonstrate that his novel contribution is, in fact, a non-obvious one.

In our opinion, it is logical that demonstrated "new uses" of an invention, while not solely determinative, are certainly relevant to the question of obviousness. We oppose any change in the law in this regard.

Subsection 100(g), which we view as intending to modify present law, would virtually eliminate product patent protection for new and useful chemical compounds and would limit patent claims to a new method of using. This would result in a severe disincentive to continued chemical and pharmaceutical research since that research, even if new, useful and unobvious could not be given product protection. Therefore we strongly urge that new subsection 100(g) be eliminated from the bill.

SUBSECTIONS 114(C) AND 122(A)

Subsection 114(c) of S.1321 would require the Commissioner of Food and Drugs, upon request of the Patent Office, to furnish all information of, and available to, the FDA with respect to any drug or subject matter for which therapeutic utility is asserted by the applicant for patent. The FDA Commissioner would be further required, upon request by the Patent Office, to conduct research upon special problems, including evaluation of the utility, safety or efficacy of such drugs, and to detail FDA officers, and employees to the Patent Office as may be necessary. The FDA Commissioner would be required to submit all information of, and available to, the FDA, notwithstanding any other provision of law.

The Food, Drug and Cosmetic Act (Title 21) was amended in 1962 by the addition of a new subsection 372(d). This subsection provides that the Secretary of Health, Education and Welfare is authorized and directed, upon request from the Commissioner of Patents, to furnish full and complete information with respect to such questions relating to drugs as the Commissioner may submit concerning any patent application. Subsection 372(d) further provides that the Secretary of Health, Education and Welfare is authorized, upon request, to conduct such research as may be required. The legislative history of subsection 372(d) clearly indicates that the patent Office, at its discretion, and without the prior consent of the patent applicant, may seek the advice of HEW experts on certain scientific issues. The Patent Office remains the arbiter of patentability and in no way abdicates this responsibility. Subsection 372(d) was intended to "help to insure that patents are promptly issued for those developments in the drug field which are true inventions which the patent system is designed to reward. It would not slow the pace of drug research which is so vital to continued improvement in the public health."

We understand that the Patent Office has sought the expert advice of HEW approximately 20 times since 1962. The Patent Office has never requested that HEW conduct research. The HEW or FDA written report responding to specific Patent Office inquiries is made a part of the patent application file, is made available to the applicant, and is then available to the public if the patent is granted. However the information supplied by HEW is publicly available only if the Patent Office grants the patent, and no information submitted by the patent applicant, or by any third party, to either HEW or FDA, is disclosed when the patent issues.

Subsection 114(c) confuses the clear distinction between FDA's mandate to require a drug manufacturer to establish the safety and efficacy of a new drug before government marketing approval is obtained, and the Patent Office's mandate to grant patent protection on new and useful advances in the art. Thus, subsection 114(c) which suggests that patentability could somehow be conditioned upon the type and extent of the information available to another Government agency, would discriminate against the patentability of drug

inventions. One well-recognized objective of the United States patent system is to encourage public disclosure, at the time a patent is issued, of new and useful inventions so as to stimulate others to improve on the disclosed technology. This objective is frustrated if patentability is conditioned or delayed until FDA marketing approval is obtained.

In addition a suggestion that patent status be delayed until market status is determined would inevitably result in less, rather than more, commercialization of new and useful products since the incentive to invest developmental funds would be weakened because the patent status of the uncommercialized product had not been determined. The patent system serves to encourage commercialization of unmarketed products only to the extent that the scope of patent protection can be assessed by the potential developer before commitment of investment funds. Determination of patent availability is particularly crucial before tremendous investment funds are committed to the commercial development of new drugs. Pharmaceutical products classified as new drugs may not legally be marketed unless the FDA has approved a new drug application for the particular product. New drug applicants must submit to the FDA extensive evidence establishing safety and efficacy under exacting standards. It has been estimated that the human and animal studies and other research necessary to obtain FDA approval costs on the average three to five million dollars for each new drug. This research effort requires from five to seven years on the average.

Finally, the sheer volume of material submitted by new drug applicants to the FDA would be of no practical use to the Patent Examiner. He could not properly utilize this information in determining patentability since the FDA information relates to animal and human safety and efficacy tests required by the drug laws and not to the issue of whether the compound is a new, useful and unobvious, and therefore a patentable, advance in the state of the art.

In our view, 21 U.S.C. 372(d) is an acceptable provision by which the Patent Office may seek the advice of other government scientists in particular instances without significant adverse consequences to the public or the patent applicant. 21 U.S.C. 372(d) was enacted in 1962 as an alternative to a proposal which would have in effect conditioned the patent grant upon a determination by a separate Federal agency of greater therapeutic effect. A patentability requirement of this extreme nature was wisely rejected by the Congress. Similarly a suggestion as implied in subsection 114(c) that patentability be conditioned upon market status, or upon a showing of greater utility, safety or efficacy, should not be favorably considered.

Subsection 122(a) would require that the Patent Commissioner, prior to the date of first examination, make available for public inspection and copying all pending applications for patent, and any papers filed during the prosecution of the application.

In our view subsection 122(a), in itself, creates a severe disincentive to the utilization of the patent system, since all information submitted by a patent applicant would automatically be made publicly available prior to any examination for patentability or indication of allowability by the Patent Office. It must be expected that inventors will be reluctant to make disclosure to the Patent Office, knowing that the information will be made public prior to any Patent Office decision on patentability. Proposed subsection 114(a), when read in conjunction with subsection 122(a), would result in the public disclosure of information submitted to the FDA by either the patent applicant or some other individual or company. These provisions go far beyond the present requirements of both the Patent and Food, Drug and Cosmetic laws, and are in direct contradiction to the provisions of the 1966 Freedom of Information Act.

The resultant effect then of proposed subsections 114(c) and 122(a) would be public disclosure of information supplied to the FDA by either the patent applicant, or by any other individual or concern. New drug products may not be marketed until the FDA has first approved a new drug application. The research effort to generate the animal and human safety and efficacy data to support a new drug application consumes five to seven years, and costs three to five million dollars. The great majority of the information contained in the new drug application—and in the investigational new drug file submitted prior to the filing of the formal new drug application—consists of trade secret and commercial or financial information, which is privileged or confidential, and

other information, such as medical files, which is exempt from disclosure under the Freedom of Information Act. This information is submitted to the FDA by private parties upon the understanding that it will be retained as confidential and not disclosed. The information is of great commercial value since a new drug may not be marketed unless the FDA has first approved a new drug application based on the extensive submission made by the applicant.

On May 5, 1972, the FDA proposed extensive amendments to its current regulations regarding the disclosure of information under the 1966 Freedom of Information Act. This proposal has not yet been finalized. The PMA has strongly objected to those provisions of the FDA May 1972 proposal which are inconsistent with the exemptions to disclosure provided in the 1966 law. It is essential to note, however, that even under the FDA proposal, which is designed to increase public disclosure, the great majority of the information and test results contained in new drug application files would not be disclosed since these materials are considered trade secrets and commercial or financial information or otherwise exempt from disclosure.

On August 17, 1973 the Department of Health, Education and Welfare amended its regulations regarding the availability of information under the Freedom of Information Act. The HEW regulation provides that information of a personal and private nature or having commercial, financial or professional value in which the applicant has a proprietary interest will not be disclosed.

Subsections 114(c) and 122(a) would inevitably result in public disclosure of trade secret, other commercially valuable information and medical information. To this extent these provisions contravene the 1966 Freedom of Information Act. In addition, subsections 114(c) and 122(a) would not provide any procedural safeguards to protect the owner of the commercial information from unauthorized disclosure.

Finally these provisions would create a severe deterrent to the potential patent applicant, particularly the drug patent applicant, since his initial disclosure to the Patent Office could well result in the public availability of all of the information he has previously submitted to the Food and Drug Administration.

It may be argued that subsection 122(a) would not compel public disclosure by the Patent Office of information from FDA files, since the FDA material would not constitute "papers filed during the prosecution" of the application. This interpretation is inconsistent with existing practice under 21 U.S.C. 372(d) by which the FDA's report is made a part of the application file. Even if the above interpretation were correct, subsection 114(c) is an unwarranted legislative provision.

SECTION 273

Section 273 would permit a patentee to recover damages for the unauthorized practice of the patented invention during an interim period (as defined in subsection 273(b)) before patent issuance. Damages would be limited to reasonable royalties without injunctive or other relief for subsequent use or sale of products made prior to the patent grant. In addition the courts would be permitted to provide for continued practice of the patented invention after the patent issued. This section strongly suggests that a party may not enjoin a prior user when the patent issues. The adverse consequences of this section are particularly discriminatory against the drug patentee when viewed in connection with subsections 114(c) and 122(a). These latter sections would permit a second manufacturer to gain access to the new drug files, and other materials submitted by the patent applicant to the FDA, by the simple expedient of copying the publicly available patent application records.

The second manufacturer could then submit this information to the FDA in support of his own new drug application, market the product before the patent issued, and not be confronted with the threat of being enjoined when the patent is granted to the first manufacturer. It must be expected that the new drug originator will be discouraged to disclose his invention to the Patent Office in the hope of later being awarded a patent, when faced with the threat of public disclosure of his proprietary new drug application research, particularly when there is no practical possibility of enjoining his competitor when the patent issues.

SUBSECTION 153(b)

Subsection 153(b) would define the term of the patent to be 12 years from the filing date of the application, provided that there will be added to the 12-year period the period of time during which examination was deferred. This provision, if enacted, would effectively limit the patent term to something less than 12 years from the date of grant. On the average the patent term would be about 10 years, since the average patent application examination period is less than two years. The PMA endorses the concept of relating the patent term to the date of filing of the application, provided the patent term is of sufficient duration so as not to nullify the basic objectives of the U.S. patent system. The limitation of the present term to a shortened period of approximately 10 years would be particularly discriminating with respect to subject matter which may not be marketed without advance federal government approval, such as is the case with new drugs. As referenced earlier, on the average, five to seven years of intensive research are required to generate the information needed to obtain federal marketing approval. During this time the drug applicant must conduct extensive animal and human trials to establish the safety and efficacy of the product. In many instances, particularly in recent years, the patent covering a new drug issues well before marketing approval is obtained. The duration of the patent examination has been lessened in recent years and the FDA clearance procedure is becoming more time consuming. In many cases the patent term for a new drug is already of limited duration since the patent issues several years before the drug is approved for marketing. A limited patent term of twelve years from filing would thus be particularly discriminatory to inventive subject matter which may not be marketed without advance Government approval.

CONCLUSIONS

The PMA strongly opposes the enactment of subsections 100(g), 114(c), 122(a), 153(b) and section 273. We appreciate the opportunity to submit comments for the Subcommittee's consideration in evaluating the provisions of S. 1321. If you require additional explanation of the PMA's position, we will provide whatever additional materials are needed or desirable.

C. JOSEPH STETLER.

STATEMENT OF PHILLIPS PETROLEUM COMPANY

Phillips Petroleum Company is a highly integrated petrochemical company which has enjoyed a rapid growth since it was incorporated in 1917.

We became very patent conscious in the mid-1920's when we were sued for alleged infringement of a patent. Technical people who were hired for the purpose of preparing a defense of that suit formed the nucleus of a new research department. That developed into what has through the years been a very effective research activity.

During World War II, Phillips designed and built the first commercial plant for the manufacture of butadiene, a product to be used in the manufacture of rubber desperately needed for tires. The American Chemical Society later recognized Phillips for its research excellence in connection with its commercial development of cold rubber and of a process for producing carbon black from oil. These are but a few of the firsts from Phillips' research. Phillips has licensed many of its synthetic rubber and carbon black developments in foreign countries as well as in the United States.

PATENTS FOSTER COMPLETION

We believe that communication between scientists carrying on the research is vital to the degree of success of that research. A success story in which this element of open communication among scientists played no small part may serve to demonstrate that point. In 1952, two Phillips' researchers were working on a project for producing motor fuel from gaseous hydrocarbons when they discovered that their equipment was becoming badly plugged with a white, solid, waxy-type material. Examination of that material disclosed that it contained a relatively high density polypropylene of a type which had not

theretofore been produced commercially. Further work soon showed the process would produce high density polyethylene in high yield. Utilizing our usual open communication between scientists, Phillips assembled a sizeable group of persons who were able to apply their various skills in the laboratory, in bench-scale work, pilot plant work, and in the design and construction of a multi-million dollar commercial plant. Within a relatively short period of time after that initial discovery, our first patent applications were on file in the United States Patent Office. By the end of 1956, Phillips had authorized and constructed its own commercial plant, had licensed three United States companies and eight companies outside of the United States to utilize the Phillips process for producing high-density polyethylene.

Our sense of security in knowing that the original discovery and process details were being protected by means of patent applications (by the end of 1965 resulting in 288 patents) not only permitted us freedom in carrying on our research but it permitted us to publish a number of scientific papers on the process and products and to train plant operators in the broad concepts of the process. It permitted us to exercise considerable freedom in discussing details of the process with various engineering companies who were proceeding with the mechanical design necessary to build commercial plants on our behalf as well as on behalf of the licensees.

It is worth noting at this point that in the latter part of 1954, a German scientist, Dr. Karl Ziegler, began licensing a new process for making high density polyethylene based on his technology. Both Phillips and Ziegler were diligent in filing patent applications to protect their respective developments. However, it was only after several years of major financial investment that producers of high density polyethylene were able to develop sufficient large volume uses for that product to permit any real optimism for its future. By the end of 1965 (about 13 years after filing our first patent applications on the process) the production of high density polyethylene in the U.S. was about 900 million pounds per year. It is anticipated that by the end of 1973 U.S. production will total about 2.8 billion pounds. Instead of two processes, there are now at least sixteen competitive high density polyethylene processes or variations.

We have referred to this development for the purpose of demonstrating that the issuance of patents does not prevent competition. The opposite is true, patents foster competitive research.

While we strongly support the avowed objectives of patent reform legislation, we find many of the provisions of S. 1321 to be such as might provide a strong deterrent for widespread use of the U.S. patent system.

PUBLIC COUNSEL

We agree that it is desirable to obtain a high likelihood of validity of any patent issued by the Patent Office. The public should not have to be concerned with invalid patents. Cost of patent litigation is so great that it makes adjudication almost impractical. It is even debatable in many instances whether the patentee will be able to obtain a net profit on his patent if he has to sue before he succeeds in licensing. The cost of litigation alone is sufficient incentive for the attorney to use this best efforts to obtain only valid patents.

If there was a greater likelihood of validity, fewer patents would have to be litigated. However, no cure should be adopted which would increase the cost of obtaining a patent to a point where the American public is deprived of the far ranging benefits of the patent system.

The provision for Public Counsel in S. 1321 would (1) drastically increase the cost of obtaining a patent, and (2) could well result in long delays in patent prosecution. This provision would establish costly and lengthy discovery procedures together with a super examining force superimposed over the examining force which presently exists. Instead of providing a system for improving the examination with the present examining staff, S. 1321 would simply increase the manpower by providing a second tier of examiners over the present examining staff.

One reason given for the need for Public Counsel is to prevent fraud on the Patent Office. The objective is good. However, does the fault require the cure? In the period 1968 through 1972 the courts ruled on the validity of 880 separate patents. In 66 of those cases, fraud was alleged. The courts found fraud

or unclean hands in only 17 of these, or 1.94 percent of the total cases considered. As reprehensible as fraud may be, we do not believe that the magnitude of this problem justifies the proposed solution.

As a side note, we believe that if attorneys defending their clients in patent infringement actions would refrain from pleading a fraud defense until actual evidence of such is uncovered, the picture of malpractice in the Patent Office would assume its real perspective.

ADVERSARY PROCEEDINGS

Our experience with opposition proceedings in foreign countries indicates that such practice results in a considerable increase in costs, and is often used primarily to delay the issuance of a patent. We believe that quality can be obtained without the use of oppositions. For this reason, we oppose this proposed change in the patent system. Some suggestions for obtaining the result of quality without undue increase in costs are listed at the end of this statement.

DEFERRED EXAMINATION

We favor the provision for deferred examination if adequate safeguards are provided for protecting secrecy rights. For example, no publication of an application should take place prior to 18 months following its filing date and no publication should be made if during that 18 months a request for examination is made or the application is expressly abandoned. A research program is very time consuming and expensive. Most companies will not wish to publish certain results of their research unless they have a good chance of getting patent protection. The safeguards to which I have referred would give a reasonable opportunity for evaluating that possibility.

MAINTENANCE FEES

We oppose the imposition of maintenance fees, and particularly those provided in S. 1321. Such fees discriminate against corporations because of size and for no other reason. The fees as provided in S. 1321 are confiscatory in nature. Even with the unreasonable term of twelve years and assuming two years to issue the patent, the total of the six payments which would be paid if the patent was maintained for its full life would be at least \$11,264. This would be a powerful deterrent against using the patent system.

The problem of how best to finance the operation of the Patent Office is perennial. Furthermore, the push to have patent fees pay more and more of the costs of the Patent Office becomes stronger and stronger. There appears to be little realization of how closely publications in technical journals are tied to the protection of patents. The corporate inventor likes to publish the results of his work. Corporations encourage such publication if reasonable patent protection can be anticipated. In our estimation, the public is the recipient of great benefits from operation of the Patent Office, not only by issuance of patent disclosures themselves but by the earlier publication of technology in journals.

Some persons have strongly voiced arguments that when a patent is used the patentee gains and should pay substantial fees to support the Patent Office. If use of such a patent results in an increase in the user's profits, the income tax laws extract considerable payment. Of course, no portion of the income tax is earmarked for support of the Patent Office. It, like fees collected directly by the Patent Office, goes into the General Fund. In view of the tremendous contribution of the patent system to the public benefit, it is not logical to expect direct Patent Office fees to support more than fifty percent of the Patent Office operation. The public is the recipient of tremendous benefits, so due consideration should be given to their equal financial support of the patent system.

LIFE WITHOUT PATENTS

The individual inventor can maintain his inventions in secrecy without difficulty. However, companies having research groups, dealing in complex research programs, under some circumstances may be forced to forego patent protection and to resort to a trade secret type operation. This will be particularly difficult to handle in the United States where the scientific population is transitory in nature. Unlike some countries, such as Germany and Japan,

where technical people spend most of their lifetime with one particular employer, scientists in the United States tend to move from job to job. Obviously, if a new patent law provides an inadequate term or if secrecy of technology presently inherent in the patent system is eliminated without adequate protection or if the law is otherwise confiscatory in nature, it may be necessary to resort to trade secrets. One aspect of such reliance on trade secrets might limit the amount of information which any particular scientist may be given with respect to any process or operation. Under such a system few persons would have more than a very small portion of a given package of technology available to him. The same would be true of operators of commercial plants. Such a system is undesirable from several points of view. The open communication, such as we have referred to in connection with Phillips' high density polyethylene development would be precluded and the volume of technical journal and patent publications which would be available to the public would be practically eliminated. It would also make licensing of technical developments very difficult.

PATENT OFFICE

We believe that there may be some advantages to making the Patent Office an independent agency. However, in our government of ever multiplying agencies, we believe the interests of the public will be best served by maintaining the Patent Office as a part of the Commerce Department. We recommend that the Commissioner of Patents be elevated to the post of Assistant Secretary of Commerce and report directly to the Secretary of Commerce.

SUGGESTIONS

We do not wish to imply by the foregoing that we are satisfied with the quality of many U.S. patents. We share a strong desire to improve that quality. However, careful attention should be given to the matter of increased cost to each applicant which that improvement may cause. In that spirit, we propose: that

- (1) We utilize our present examining force;
- (2) The examiner be required to oppose the issuance of a patent in the absence of his firm conviction of patentability;
- (3) A memorandum of each interview, signed by both the examiner and the attorney be made a part of the permanent file;
- (4) Before passing an application to issue, the examiner would be required to confer on the question of patentability with at least two other examiners skilled in the same subject matter and to gain concurrence of at least one of them on the question of patentability;
- (5) The position of each conferee would be made of record in the permanent file; and
- (6) When an appeal is involved and an oral hearing has been granted, the examiner would be required to present his position orally before the Board of Appeals.

One factor which contributes to a lack of quality of patents being issued from the U.S. Patent Office is that the examiners are faced with court decisions from a multitude of courts and judges. It is obvious that there is a lack of uniformity in decisions from those judges. This is akin to having a few hundred bosses. Now is the time to establish a Patent Court which would be given full responsibility for trying all infringement and validity actions. This would provide more uniform guidance for Patent Office standards.

TERM

A twelve-year term extending from the date of filing would not provide a sufficient incentive to justify a disclosure of the valuable technology developed in connection with the high density polyethylene processes which I have discussed above. In view of the tremendous sums of money required to both develop the process and markets for the product, competitors could afford to sit on their hands and wait for the patents to expire and the markets to develop.

In this connection we urge that you refer to a report prepared by Mr. Eugene W. Geniesse for the Subcommittee on Patents, Trademarks and Copyrights as part of its study of the U.S. patent system conducted pursuant to

Senate Resolution 240 of the 86th Congress. The report, Study No. 29, is one of a series prepared under the supervision of Professor John C. Stedman, associate counsel of the Subcommittee. At page 49, speaking of a proposal which would limit the patent term to 20 years (rather than 12 years) from the date of filing the application. Mr. Geniesse stated:

"It is the writer's view that the proposed 20-year limitation would be inequitable to inventors unless tempered by a requirement for a ruling apportioning the blame for delays."

FURTHER HEARINGS

A number of other provisions of S. 1321 should be considered in hearings. We trust that opportunity will be provided at a later date for consideration of the balance of the bill.

ROCHESTER, N.Y.,
September 13, 1973.

Re S. 1321.

U.S. Senate,

Committee on the Judiciary,

Subcommittee on Patents, Trademarks and Copyrights,

Washington, D.C.

GENTLEMEN: The "Legislation Committee" of the Rochester (New York) Patent Law Association (168 members) has held a series of open meetings for the purpose of determining what kinds of changes in the Patent Laws of the United States might be necessary in order to substantially improve the strength of our Patent System. At the outset, we agreed with those critics of our present system that some changes are necessary. Our minimum objective was to halt the apparent avalanche of court-made law that threatens to make almost every patent unenforceable. Our ultimate objective was to recommend changes in our Patent Laws which, if adopted, would result in

(a) the issuance of patents of high quality, and

(b) the adoption by our Federal Courts of a *positive* attitude toward patents.

We accepted the fact, for example, (which I believed was expressed by several Federal Judges including Justice Fortas) that one very important reason why the Courts seem to approach patents with an extremely negative or "anti-patent" attitude is that these important patent rights are issued as a result of an *ex parte*, essentially non-adversary, proceeding before a relatively minor Federal employee. Justice Fortas, and substantially the entire Rochester (New York) Patent Law Association membership, believe that a very significant improvement in the attitude of our Courts toward patents can be made by providing some sort of meaningful adversary type proceeding in the Patent Office. (As a matter of fact, more than 95% of the membership of the RPLA favors the introduction of a meaningful adversary procedure into our patent procurement practice.) Of the various alternative "adversary-type" practices that can be considered, we recommend to you the approach being presently considered by the Commissioner of Patents, relating to the "voluntary" subjection by the patentee to a "Protest Procedure", as outlined to you a few minutes ago.

We feel that the mere citation of art to the Patent Office would not be of a sufficiently adversary nature to overcome the aforementioned anti-patent bias of a large part of the judiciary. On the other hand, we believe a full fledged opposition procedure like that in the United Kingdom would tend to be too expensive for (and therefore discriminatory against) the individual inventor. Hence, we believe effective control of whatever adversary procedure is adopted should remain with the Patent Office, with the opposer being unable to drag out the proceedings unreasonably.

We would like to add one additional feature to any adversary procedure that might be adopted. That is, cited art, briefs and arguments, and information and affidavits concerning prior public use, etc. which are submitted by third parties (after publication of the application) should be reviewed by a group of three members of an enlarged Patent Office Solicitor's staff which is charged to help strengthen the patents, and who do so (a) by determining whether to reopen the prosecution of the application in view of the material supplied by the "protestor" and (b) by handling the subsequent communica-

tions with the patentee on these matters. One member of the Protest Review Board would be the Primary Examiner handling the case. This would overcome any possible bias on the part of the Examiner in favor of the patentee which may have developed during the prosecution.

Please note that this latter suggestion of ours sounds something like the "Public Patent Counsel" of Senator Hart. We believe our "Protest Review Board" would, in fact, function to some extent like the Senator's proposed Public Patent Counsel by, for example, also having the power to become involved in the initial prosecution of important applications, and representing the Examiner before the Board of Appeals. On the other hand, we are definitely against the strong subpoena power that Senator Hart has proposed be made available to the Public Patent Counsel. We also believe that any Public Patent Counsel should be responsible to the Commissioner of Patents.

Other items which are strongly endorsed by the Legislation Committee of the Rochester (New York) Patent Law Association are

(a) Maintenance fees, wherein fees are very low for the first 8-10 years, and then escalated thereafter.—This is to help efray the costs of the Patent Office and to encourage the abandonment of all but the most important patents after the patentee has had a reasonable time to commercialize his invention. Senator Hart's proposal to require excessive payments which begin after only 4 years is totally impractical because *more than* four years are almost invariably required to develop an invention to the point of commercial action. The proposal of S. 1321 would effectively eliminate the independent inventor and the small company from the U.S. patent system [Section 41(e)(2) notwithstanding].

(b) A deferred examination procedure combined with the early publication of all applications with publication being accomplished about *18 months* after filing.

(c) The acknowledgement in Section 1 of S. 1321 that patents are temporary property rights (rather than "privileges").

(d) The additional acknowledgement that almost every patent, by definition, cannot be a "monopoly". In this respect we suggest the addition of a new paragraph to Section 1 of S. 1321 as follows:

(b) A patent is personal property and shall be treated as such subject to the provisions of this title. Like all property a patent may constitute a monopoly through control of a relevant market. Control of a relevant market is not possible where an alternative to the patented invention exists in that market or where the invention is widely licensed or offered for license. In the instance where a valid patent does control a relevant market and thus is a monopoly for a period of years under this title, it is expressly exempt from the antitrust proscriptions of any statute of the United States as a partial incentive to promote the continued progress of science and useful arts.

(e) The institution of a "petit" patent system. Actually this would be a preferred alternative to a "deferred examination" procedure. (A brief description of such a system is attached hereto as "Appendix I").

We hope that the above comments will be given the serious, favorable consideration they deserve during the deliberations of the Committee on the Judiciary on Patent Law revision. Please note that they represent the overwhelming opinions of a group of patent professionals representing all types of clients. By comparison, it is readily evident that whoever drafted the major portion of S.1321 had very little, if any, practical experience either in Patent practice or in the business world. In our opinion, the adoption of S.1321 in its present form would result in the effective destruction of the United States Patent System because inventors would be discouraged from seeking U.S. patents. Instead, the incentive in this country to invent and to disclose would disappear; the objective "to promote the progress of science and useful arts" would be lost; and any research that might survive in such a discouraging "patent" environment would be protected as a trade secret. We would much prefer the adoption of a more reasonable bill like the Patent Law Modernization Bill proposed by the American Patent Law Association.

Sincerely,

JOHN T. LEWIS,
Chairman, Legislation Committee,
Rochester Patent Law Association.

APPENDIX I.—A PROPOSAL RELATING TO THE ISSUANCE OF TWO CLASSES OF PATENTS

A "regular" patent would be the same as the present utility patent, while a limited patent would have a life of five years from the date of issue. A "limited" patent would be subject to the patentability requirements of Section 102 only, i.e., novelty, and Section 103 would be inapplicable.

Upon filing an application, the inventor could elect whether to have his application considered for a limited patent, a regular patent, or both. The Examiner would examine the application in the same manner as he does now, however, at the time of his first office action, if he has not found a §102 rejection, and the applicant has elected for examination as both a limited and a regular application, the Examiner will indicate to the applicant that his case would be allowable as a limited patent.

The applicant can continue to prosecute his case as a regular patent and, if he is successful, a regular patent will issue the same as now. If the applicant is not successful in obtaining claims for a regular patent, because of obviousness, or if he feels that the claims he will receive are too narrow to be of any worth, he may elect to have his limited patent issue and drop his request for regular patent coverage.

The fees for filing a limited patent would be roughly 75% of those of a regular patent and, if the applicant elects examination as both a limited and a regular patent, he would pay both fees.

STATEMENT OF JOHN T. ROBERTS

INTRODUCTION

In November 1966, nearly seven years ago, the President's Commission on the Patent System issued its Report containing thirty-five recommendations, many of which were multipart, for amending the patent laws. Since that time, each hearing before Congress, excepting those directed to licensing practices, has been all-inclusive, each witness addressing every subject.

Without second guessing the Commission's stated belief that tackling problems one at a time would lead to internal contradictions, two unfortunate results are apparent. The first is that, although there was general agreement on the following points, we have for seven years had no law including the twenty-year term, assignee filing or citation periods. The second result of the procedure is, in my view, that the controversial matters have never received individually adequate attention.

I would like initially to commend the Committee for holding hearings on selected subjects, each of which is of sufficient importance and scope to warrant all the time and testimony this Committee can give to it, to the end that any legislative proposal approved by this Committee is approved after complete hearings and consultation, not of a bill, but of that proposal.

RESTRUCTURING THE PATENT OFFICE

A vote of approbation is due from everyone concerned with our patent system to the author of S. 1321 for laying before Congress the proposition that the Patent Office, our oldest and perhaps largest administrative agency, should statutorily be treated as such.

The proposal has had eminent advocates over the years, including former Commissioner Robert J. Watson, but the initiative, even for debate, could hardly be expected from any Administration.

From the viewpoint of a practitioner before the agency, I see very considerable benefits. Initially it will focus on the Commissioner both responsibility and authority for the operation of the Patent Office. I believe this change in authority over procedures, regulations and personnel will increase the effectiveness of the agency.

A second benefit will be the increased prestige of working for an independent agency which should make it easier to attract and retain a high caliber professional career staff at all levels. While there are many fine people in the agency there is likewise an annual exodus of many equally good ones who might have remained in an independent agency. As I write this, the Adminis-

tration is going through its near perennial search for a new Commissioner. Unfortunately, very few of those with the high qualifications the office deserves are attracted to the job under the current conditions.

A third benefit this change would make is to remove the Office from a partisan political conflict. Our government has many political departments and the Department of Commerce is to a very large extent one of them. The Patent Office, however, does not, and should not, belong to any segment of the electorate, either in substance or appearance.

ADVERSARY PROCEEDINGS

The greatest substantive benefit a new patent law could have is to allow increased adversary proceedings within the Patent Office. I submit that a well administered system would actually reduce the cost of securing and defining inventive rights.

There is no question that the cost of obtaining a particular patent will increase, perhaps substantially, where opposition by an adversary is incurred.

It is a change which I believe that substantially all inventors, whatever their economic station, will approve of once the alternatives are assessed.

There is no sadder spectacle than an inventor of modest means investing heavily in a new product and obtaining a patent only to be faced with substantial competition from a large corporation.

The classic drama is for the corporation to tell the inventor his patent is worthless because of a prior art reference assertedly more pertinent than that cited by the Patent Office.

The inventor may genuinely disagree and indeed he may be right. At present, however, he has no remedy other than an incredibly expensive infringement suit in a Federal court.

At the conclusion of such a suit, the parties and the Judge will have gone through an exercise about as extensive and time-consuming as before an examiner in applying the prior art and arguing obviousness. The tragedy of this procedure is that this exercise invariably involves less than 10%, and in my experience, usually involves under 5% of the total time and expense of the suit.

An adversary system would also benefit the general public as represented by a person accused of infringement. This person may believe that he has a good defense, but cannot afford a five or six figure lawsuit to test it. Available adversary proceedings would allow that person to lay the matter before a primary examiner and abide by his decision, continuing if favorable, and either securing a license or ceasing the operation if unfavorable.

The adversary procedures set out in S. 1321 would be substantially improved by allowing a person accused of infringing an issued patent to prove for cancellation of that patent before the Patent Office.

MAINTENANCE FEES

We must accept as a postulate that applicants and patentees must collectively pay a substantial portion of the Patent Office budget.

The very real choice is therefore payment of initial high filing and issuance fees or the option of deferring these payments.

I support unequivocally the deferring of a large portion of these fees until the applicant has had an opportunity to commercialize his invention and pay these fees from present earnings not from prior savings or indebtedness.

With this background I have three suggestions for the amendment of the fee system of S. 1321.

The first proposal may almost sound silly, but will result in a tremendous clerical saving. All fees should be due, not on the anniversary of grant, but on a day certain, e.g. July 1.

The principal purpose of the maintenance fee is to collect net revenues for the Patent Office. My experience with foreign maintenance fees is that of the gross fee paid by the client over half is used up in the clerical effort of recording receipt of the fee and mailing a receipt by the foreign Patent Office and the docket systems of the attorneys to note all of the due dates, enquire of the client about payment, reminder letters (usually), instructions for payments billing, collections, and the like.

I believe the yearly payment on a day certain will materially reduce the gross cost to the patentee, relative to the net return to the Government.

As a background to my second proposal, in the 1966 House hearings one of the subjects discussed was whether Congress or the Commissioner should set the fees. The argument made by the Administration was that it could not have time to secure legislation to meet the required portion of yearly budget increases. I remember distinctly and commend to this Committee the statement of then Representative Poff that Congress stands ready to respond much more promptly than the Administration to initiate any fee revision.

I urge this because I believe that Congress should oversee and couple together the yearly appropriation and the respective fees. Before a committee of Congress the public could be heard on the necessity of particular expenditures and the resultant increase if any in fees.

I could now mention two practices of the Patent Office which add perhaps \$5-10 million to the annual cost of examining patents, and are without justification other than history.

This is, however, not the proper moment to debate whether the current Patent Office budget of \$68 million for fiscal year 1974 is justified or whether provident management could control it.

What is proper to debate here is whether Congress will scrutinize as closely as proper a recompensed budget and whether a future Commissioner will respond to public pressures to control costs or would increase his fees to justify even larger budgets.

If this latter course occurs, then the patent system will truly become the exclusive property of our wealthiest and largest corporations who will happily pay large fees to secure their own patents and preclude this form of competition from the small newcomer.

The third matter is the amount of fees specified in S. 1321. Section 41(c) prescribes maintenance fees which may total as much as \$16,000 per patent. There are well intentioned and generous exemptions for "individual inventors," "small investors" and good faith unsuccessful efforts.

The thrust of these provisions appears clearly enough not to raise revenue but to reduce the patent portfolios of large corporations by selective discriminatory taxation.

While this may indeed occur, I suggest a major beneficiary of this system will be the legal profession. The patent bar will again raise, and litigate extensively the requirement of dividing out inventions into separate patents and rather than straightforward assignments of patent rights there will return the convoluted exclusive licenses, patent holding corporations and other legal subterfuges whose sole purpose is tax avoidance.

This Committee may have misgivings about a twenty-year patent in the hands of certain interests. Against the unused inventions this or any maintenance fee will have effect in forcing abandonment. Against this most widely used inventions and the therefore most potent patents even this fee will have little effect. I would suggest then that such a system of taxation is not well designed to achieve control over a dominant patent or a successful commercial product.

DEFERRED EXAMINATION

The objective of deferred examination, the reduction of unnecessary work, is laudable. I believe there are identifiable classes of patent applications which require little if any examination. I would commend to the Committee's attention statutory modification in those areas, as set out below.

As to the deferring of examination of all patent applications generally, I must oppose it because the price the public would pay to a certain class of inventors would be too high.

There is an inherent vice in the patent system which legislation over the past century and a quarter has attempted to control, but which this proposal would greatly expand.

The patent system was truly designed to protect the inventor who carries forward his new machine or method to commercial fruition and as an ancillary matter obtains a patent on that subject.

Our patent laws, however, also invite applications by persons who have identified a problem and speculated about possible solutions. It invites them to file an application and let it lay fallow in the Patent Office until another goes to

the real work and expense of experimenting and devising the operable invention.

Perhaps the classic case is the Selden automobile patent, kept pending from 1879 until 1895 when others had finally devised an operable car. Mr. Selden's efforts to enforce his patent on the industry very nearly succeeded. See *Columbia Motor v. Duerr*, 184 Fed. 893 (2 Cir. 1911).

Mr. Selden's legal procedure was not his original invention. Fifty years earlier Judge Greer in *Goodyear v. Day*, 10 Fed. Cas. 687, stated:

"When genius and patient perseverance have at length succeeded. *** Every unsuccessful experimenter who did, or did not come near making the discovery now claims it."

The proposal for deferred examination is in substance almost identical with removing all the restrictions placed over the years on reissue applications.

Nearly one hundred years ago, Congress was told by an attorney:

"Granting reissues . . . is an unmitigated fraud . . . A very large majority are taken out for the sole purpose of incorporating an improvement subsequently made by others." (Committee on Patents, 1878).

That same year, in the case of *Railway v. Sayles*, 97 U.S. 554, Justice Bradley stated:

"Courts should regard with jealousy and disfavor any attempts to enlarge the scope of applications once filed or of patents once granted, the effect of which would be to enable the patentee to appropriate * * * that which has in the meantime gone into public use. * * *"

In that case an application was filed in 1847 for double truck railroad brakes. To quote the opinion, "the application lay dormant for five years" and then "being considerably modified and changed" issued in 1852. This revision was sufficient to successfully assert in the Circuit Court the patent against he concurrently developed "Stevens" brake.

I cite these examples from history to show that, in the future, as in the past, able solicitors and advocates will be able to take the "speculations" of "philosophers and mechanics" about "the possibilities or probabilities of certain discoveries or inventions" (Judge Greer, *supra*) and find in them the verbal equivalents of later inventions. It will indeed be profitable source of new business to the legal profession but will cause the patent system a well justified condemnation from the public it is designed to benefit.

SELECTIVE EXAMINATION

Earlier, I stated the regular examination of certain claims of patents was not necessary and which therefore created an unnecessary burden on the system.

Since recognition of these classes of patents would require statutory action, and would reduce or eliminate examination, I feel the subject pertinent to suggest as an alternative to the deferred examination of S. 1321.

PATENTS OF IMPROVEMENT

The laws of most foreign countries, e.g. France, Great Britain, Japan, Germany, provide this class of patents for the owner of the base patent. This is not an added luxury for inventors, but an intelligent alternative since a sizable percentage of our 100,000 annual patent applications are presently for this class of patents.

This is not the place to demonstrate why these applications, perhaps 20,000 per year, are filed, examined and aggressively prosecuted. Suffice it to say here that a more intelligent statutory scheme would allow the owner of a patent to file for a patent of improvement, which because it depends for its validity on the main patent, need not be examined.

SHORT TERM PATENTS

These have been a feature of German patent law for over fifty years. Their term translates as "utility models." The number of patents filed on gadgets, toys and devices of short commercial life is very large.

The subject of short term patents has been debated for many years and has unfortunately been ensnared with the debate over whether it is Constitutionally permissible to have a lower standard of invention for certain classes of improvements.

I believe the argument is misplaced. The Constitution mandates patents for unobvious inventions in toys as well as electronics and permits no lower standard for one than another. However, the principal vice of deferred examination I have pointed out above would not apply to a patent which expires four or five years after filing.

From my own experience, I can testify that, given an option, a substantial number of inventors would choose an immediately granted, initially unexamined, short term, and less expensive patent, which would be subject to recall, and examination over its term, should a conflict develop.

Such a statutory scheme, in addition to its other benefits would perhaps eliminate the filing and examination of from 10 to 20,000 applications per year.

DEFENSIVE APPLICATIONS

A fairly common occurrence for a patent attorney is to have a client show him a development which he is using and state he does not wish a patent on it but does not wish to disclose it to his competition and certainly does not wish for his competition to obtain a patent on it. A very sound reason for this last concern is that it is often far easier to prove you "invented" something before your competition than it is to prove the invention is not patentable.

Unfortunately, the only way at present to achieve these objectives is to file an application for defensive purposes. These applications are at present examined like all others in due course.

If the defensive application were used solely to prevent the issuance of a patent to another on one's own prior invention, then deferring the examination in perpetuity would do no harm, and indeed it might be unnecessary to require the filing of the application within the one year time limits of Section 102(b).

CONCLUSION

These three proposals, patents of additions, short term patents and defensive applications, go considerably beyond the subject of deferred examination, the current enquiry.

They would, however, have, I believe, the currently relevant effect of eliminating about a third of the current workload of examination, roughly the same as the projections for deferred examination.

WYATT, GERBER & SHOUP,

New York, N.Y., September 25, 1973.

The Honorable JOHN L. McCLELLAN, HUGH SCOTT, PHILIP S. HART, QUENTIN L. BURDICK, HIRAM FONG,

Subcommittee on Patents, Trademarks and Copyrights, Committee on the Judiciary, U.S. Senate Russell Office Building, Washington, D.C.

DEAR SIR: I enclose a proposed amendment to the Patent Act of 1952 (Title 35, United States Code), which I believe deserves close and careful consideration in connection with any amendments to be made to the Patent Laws. My belief is buttressed by substantial support from the objective academic community.

The amendment is designed to meet a recent 5-4 Supreme Court decision holding that a United States patent evader could copy *exactly* a patented machine when the machine is made for, or sold to, a foreign customer, so long as *one part* is not "finally" bolted to the machine in the United States.

Thus, having disclosed his invention to the public in his United States patent, and "[promoted] the Progress of Science and the useful Arts" (United States Constitution, Article I, §8, cl. 8), the American inventor gets nothing for his invention.

The 5-4 majority held, remarkably, the United States patents may be evaded in making and selling patented items for export merely by packaging one part or ingredient of the item separately or by telling the foreign customer where to obtain that one part or ingredient.

The proposed amendment is enclosed as Appendix A to this letter. The amendment is designed to overturn the Supreme Court majority opinion. Until there is an enforceable international patent, some domestic legislation of this type is necessary to protect United States inventors from the transparent evasion that the Supreme Court majority countenanced. An attempt has been

made to track present statutory language as closely as possible, specifically 35 U.S.C. §271(b) and §271(c). An amendment alternative to the one enclosed could have been drafted to directly meet the Supreme Court majority. This amendment could have referred to making or selling "substantially all" of the material parts of the invention.

The central purpose of the proposed amendment is to meet the ramifications of the 5-4 decision of the Supreme Court in *Deepsouth Packing Co., Inc. v. The Laitram Corporation*, 406 U.S. 518, 92 S.Ct. 1700, 32 L.Ed.2d 273 (May 30, 1972), motion for leave to supplement Petition for Rehearing granted, rehearing denied, 409 U.S. 902, 93 S.Ct. 94, 34 L.Ed.2d 165 (October 10, 1972). A copy of the majority and dissenting opinions in *Deepsouth v. Laitram* is enclosed as Exhibit B to this letter.

The majority opinion is a fairly stunning example of the triumph of form over substance.

Perhaps the most practical test of the inequities of the bare majority opinion is to put the question to a general lawyer, unfamiliar with patent law, or a layman, as to whether or not the fact situation in *Deepsouth v. Laitram* is patent infringement—the inevitable reaction is *yes*, it is infringement.

But that is not what the Supreme Court held.

The unfortunate results of this 5-4 decision are as follows:

(1) Total emasculation of United States patent protection for items made of more than one part and intended for export.

(2) Placement of great financial burden on a fledgling United States business enterprise (or on individual inventor) making an invention which may be of great value and not having the \$10,000 to \$50,000 (or knowledge or foresight) to obtain patent protection for that one invention in the more than 100 countries where it is available.

(3) Discrimination, insofar as patent protection is concerned, between United States inventors of physically large machines which are impossible to assemble at the manufacturing site, e.g. oil drilling rigs, and physically small machines or items, e.g. kitchen implements.

(4) Requiring a United States patentee to bring patent infringement actions against prospective, (current or past) foreign customers who have bought from the United States patent evader. Does a businessman want to sue a prospective customer? No!

(5) Where the patent evader is a United States company, it is impossible to bring suit directly against that evader, in the United States, or anywhere, if that United States evader has no place of business in any foreign country.

(6) As for infringement suits in foreign jurisdictions, there is great uncertainty in result, because, generally, there is no comity given to decisions on patent validity by the courts of one country to those of another.

(7) The addition of a new dimension to the "knowledge" requirement of §271(c) of the present patent law. The patent owner-plaintiff must now *know*, in order to bring an infringement suit, that the last screw on an infringing item will be tightened within the United States. This is impossible. There is no way of knowing when a storeowner sells a patented "knocked-down" child's doll house or a coaster wagon in Detroit, whether the doll house or coaster wagon will be finally assembled in Honolulu, Bismarck, Mexico or Japan.

There are, additionally, two ironical legal inconsistencies resulting from the decision:

(1) United States court decisions are *unanimous* in the protection of the other Constitutionally based and intellectually created property right—copyright—in analogous situations. See *Sheldon v. Metro-Goldwyn Pictures Corporation, et al*, 106 F.2d 45, 52(2nd Cir. 1939, Learned Hand, C.J.), *aff'd*, 309 U.S. 390 (1940); *Famous Music Corporation v. Secco Records, Inc.*, 201 F.Supp. 560, 564, 568-569 (S.D.N.Y. 1961); *G. Ricordi & Co., Inc. v. Columbia Graphophone Co.*, 270 Fed. 822, 826 (S.D.N.Y. 1920); *Fishel, et al v. Luckel, et al*, 53 Fed. 499, 501 (C.C.S.D.N.Y. 1892).

(2) The acts performed in the foreign country in *Deepsouth v. Laitram* ("final" assembly of the machine) would *not* be enough to constitute "working" of an invention under the patent laws of at least the United Kingdom or Canada. "Working", in general, are legal requirements in certain foreign countries that keep a patent in good standing. *Johnson's Patent*, 26 R.P.C. 52, 56 (1909) (United Kingdom); *Hill's Patent*, 23 R.P.C. 475 (1915) (United Kingdom); 552-553 Fox, *Canadian Patent Law and Practice* (4th Ed., Toronto, 1969).

I was principal counsel for *The Laitram Corporation* at all stages of *Deepsouth v. Laitram*, discovery, hearing in the District Court, proceedings in the Court of Appeals and briefing and argument before the Supreme Court.

There have been to this date five comments on the Supreme Court decision in law reviews:

(1) *Vanderbilt Law Review*, Vol. 26, No. 1, p. 201 (January, 1973)

(2) *Fordham Law Review*, Vol. XLI, No. 2, p. 458 (December, 1972)

(3) *Houston Law Review*, Vol. 10, No. 1, p. 216 (October, 1972)

(4) Lipman, "Deepsouth Packing Co. v. Laitram—How to Succeed in Deceiving Without Really Trying" *Journal of the Patent Office Society*, Vol. 54, No. 11, p. 695 (November, 1972)

(5) *Law and Policy in International Business*, Vol. 5, No. 1, p. 319 (1973)

Comments (1) through (4) were critical of the Supreme Court majority opinion; Comment (5) was not critical of it.

I enclose, as Appendix C to this letter, a copy of the comment from the *Vanderbilt Law Review*; my thanks to the Editors of the *Vanderbilt Law Review* for their permission to include it in this submission.

I have information that the *Stanford Law Review* will soon publish another comment on the Supreme Court decision; my information is that the *Stanford Law Review* comment will be critical of the Supreme Court majority opinion.

It is my understanding that the *California Law Review* planned to publish a comment critical of the Supreme Court majority opinion, but the *California Law Review* indicated that it could not improve on the arguments made in the Brief for the Respondent (the losing party) filed in the Supreme Court or an *Iowa Law Review* comment (enclosed as Appendix D to this letter). I also have information that the *Georgetown Law Journal* planned to publish a comment critical of the results of the Supreme Court opinion but that comment was scrapped when pre-empted by the prior publication of Comment (5), supra, another publication of the same law school.

A recent article in *Fortune* said that the majority opinion in *Deepsouth v. Laitram* could be described as an "obvious end run around the patent law." Hummerstone, "How the Patent System Mousetraps Inventors", *Fortune*, May, 1973, pp. 262-263.

There were five comments on the unanimous Court of Appeals decision, *Laitram Corporation v. Deepsouth Packing Co., Inc.*, 443 F.2d 936, 170 U.S.P.Q. 196 (5th Cir. 1971), (which the Supreme Court majority reversed):

(1) *Iowa Law Review*, Vol. 57, No. 3, p. 889 (February, 1972)

(2) *Texas International Law Journal*, Vol. 7, No. 2, p. 325 (Winter, 1972)

(3) *Texas Tech University Law Review*, Vol. 3, No. 1, p. 216 (Fall, 1971)

(4) *Houston Law Review*, Vol. 9, No. 2, p. 379 (November, 1971)

(5) *Washington and Lee Law Review*, Vol. XXIX, No. 1, p. 174 (Spring, 1972)

Comments (1) through (4) were favorable to the Court of Appeals decision holding in favor of the patent owner (which the Supreme Court majority reversed) and Comment (5) adverse. I enclose, as Appendix D to this letter, a copy of the comment from the *Iowa Law Review*; my thanks to the Editors of the *Iowa Law Review* for their permission to include it in this submission.

The arguments made in the two (out of ten) academic journals favorable to the bare Supreme Court majority are of no substance and are easily rebutted, but the details of rebuttal do not warrant treatment here, although they would be available on short notice.

This "box score" of academic comment is significant, as law students often are prone to attack property rights—even property rights created by intellectual activity. Yet the law students have chosen to recognize the equities the United States inventor needs to adequately protect his invention.

United States patents are "personal property" (35 U.S.C. §261). Yet the Supreme Court majority seems to say that patents are property which may be stolen at will, merely by separately wrapping a screw.

This "end run" around the patent laws, which allows the patent evader to tell his customer he has manufactured a machine, which the Supreme Court majority now tells us is not a machine, should be cut down by remedial legislation.

Respectfully,

GUY W. SHOUP.

APPENDIX A.—PROPOSED PATENT LAW AMENDMENT

The following section to be added to §271, Title 35, U.S. Code (preferably as §271(d), with present §271(d) being relettered as §271(e)).

§271.(d) : Whoever makes or sells, or actively induces the making or selling of, within the United States, for use outside the United States, a material component of a patented machine, manufacture, or composition of matter, constituting a material part of the invention, and not a staple article or commodity of commerce, knowing the component to be especially made or especially adapted for use in a machine, manufacture, or composition of matter, which, if made within the United States, would be an infringement of the patent, shall be liable as an infringer.

APPENDIX B

Notice: This opinion is subject to formal revision before publication in the preliminary print of the United States Reports. Readers are requested to notify the Reporter of Decisions, Supreme Court of the United States, Washington, D.C. 20543, of any typographical or other formal errors, in order that corrections may be made before the preliminary print goes to press.

SUPREME COURT OF THE UNITED STATES
No. 71-315

Deepsouth Packing Co., Inc., Petitioner, v. The Laitram Corporation. On Writ of Certiorari to the United States Court of Appeals for the Fifth Circuit. [May 30, 1972].

MR. JUSTICE WHITE delivered the opinion of the Court.

The United States District Court for the Eastern District of Louisiana has written:

"Shrimp, whether boiled, broiled, barbecued or fried, are a gustatory delight, but they did not evolve to satisfy man's palate. Like other crustaceans, they wear their skeletons outside their bodies in order to shield their savory pink and white flesh against predators, including man. They also carry their intestines, commonly called veins, in bags (or sand bags) that run the length of their bodies. For shrimp to be edible it is necessary to remove their shells. In addition, if the vein is removed, shrimp become more pleasing to the fastidious as well as more palatable."¹

Such "gustatory" observations are rare even in those piscatorily favored federal courts blissfully situated on the Nation's Gulf Coast, but they are properly recited in this case. Petitioner and respondent both hold patents on machines which devein shrimp more cheaply and efficiently than competing machinery or hand labor can do the job. Extensive litigation below has established that respondent, the Laitram Corporation, has the superior claim and that the distribution and use of petitioner Deepsouth's machinery in this country should be enjoined to prevent infringement of Laitram's patents. *Laitram Corporation v. Deepsouth Packing Co., Inc.*, 443 F. 2d 928 (CA5 1971). We granted certiorari, 404 U.S. 1037 (1972), to consider a related question: Is Deepsouth, barred from the American market by Laitram's patents, also foreclosed by the patent laws from exporting its deveiners, in less than fully assembled form, for use abroad?

I. A rudimentary understanding of the patents in dispute is a prerequisite to comprehending the legal issue presented. The District Court determined that the Laitram Corporation held two valid patents for machinery used in the process of deveining shrimp. One, granted in 1954,² accorded Laitram rights over a "slitter" which exposed the veins of shrimp by using water pressure and gravity to force the shrimp down an inclined trough studded with razor blades. As the shrimp descend through the trough their backs are slit by the blades or other knife-like objects arranged in a zig-zag pattern. The second patent, granted in 1957, covers a "tumbler," "a device to mechanically remove substantially all veins from shrimp whose backs have previously been slit," App. 127, by the machines described in the 1954 patent. This invention uses

¹ *The Laitram Corporation v. Deepsouth Packing Co., Inc.*, 301 F. Supp. 1037, 1040 (1969).

² This patent expired shortly before argument in this court and is therefore not relevant to Laitram's claim for injunctive relief. It is described, however, because Laitram claims damages for Deepsouth's asserted past exportation of the parts of this machine.

streams of water to carry slit shrimp into and then out of a revolving drum fabricated from commercial sheet metal. As shrimp pass through the drum the hooked "lips" of the punched metal, "projecting at an acute angle from the supporting member and having a smooth rounded free edge for engaging beneath the vein of a shrimp and for wedging the vein between the lip and the supporting member," App. 131, engage the veins and remove them.

Both the slitter and the tumbler are combination patents. That is,

"None of the parts referred to are new, and none are claimed as new; nor is any portion of the combination less than the whole claimed as new, or stated to produce any given result. The end in view is proposed to be accomplished by the union of all, arranged and combined together in the manner described. And this combination, composed of all the parts mentioned in the specification, and arranged with reference to each other, and to other parts of the [machine] in the manner therein described, is stated to be the improvement, and is the thing patented." *Prouty v. Ruggles*, 16 Petrs. 336, 341 (1842).

The slitter's elements as recited in Laitram's patent claim were: an inclined trough, a "knife" (actually, knives) positioned in the trough, and a means (water sprayed from jets) to move the shrimp down the trough. The tumbler's elements include a "lip," a "support member" and a "means" (water thrust from jets). As is usual in combination patents, none of the elements in either of these patents were themselves patentable at the time of the patent, nor are they now. The means in both inventions, moving water, was and is, of course, commonplace. (It is not suggested that Deepsouth infringed Laitram's patents by its use of water jets.) The cutting instruments and inclined troughs used in slitters were and are commodities available for general use. The structure of the lip and support member in the tumbler were hardly novel: Laitram concedes that the inventors merely adapted punched metal sheets ordered from a commercial catalog in order to perfect their invention. The patents were warranted not by the novelty of their elements but by the novelty of the combination they represented. Invention was recognized because Laitram's assignors³ combined ordinary elements in an extraordinary way—a novel union of old means was designed to achieve new ends.⁴ Thus, for both inventions "the whole in some way exceed[ed] the sum of its parts." *Great A&P Tea Co. v. Supermarket Equipment Corp.*, 340 U.S. 147, 152 (1950).

II. The lower court's decision that Laitram held valid combination patents entitled the corporation to the privileges bestowed by 35 U. S. C. § 154, the keystone provision of the patent code. "For the term of seventeen years" from the date of the patent, Laitram had "the right to exclude others from making, using or selling the invention throughout the United States . . ." The § 154 right in turn provides the basis for affording the patentee an injunction against direct, induced, and contributory infringement, 35 U. S. C. § 283, or an award of damages when such infringement has already occurred, 35 U. S. C. § 284. Infringement is defined by 35 U. S. C. § 271 in terms which follow those of § 154:

"(a) Except as otherwise provided in this title, whoever without authority makes, uses or sells any patented invention, within the United States during the term of the patent therefor, [directly] infringes the patent.

"(b) Whoever actively induces infringement of a patent shall be liable as an infringer.

"(c) Whoever sells a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer."

As a result of these provisions the judgment of Laitram's patent superiority forecloses Deepsouth and its customers from any future use (other than a use

³ The machines were developed by two brothers who are now president and vice-president of the Laitram Corporation. The patents are in their names, but have been assigned to the corporation.

⁴ The District Court wrote:

"Def. urges that the [1957] patent is invalid as aggregative, anticipated by the prior art, obvious, described in functional language, overbroad, and indefinite. While it is clear that the elements in the . . . patent, especially the punch lip material, had been available for a considerable period of time, when combined they coact in such a manner to perform a new function and produce new results." 301 F. Supp. 1037, 1063 (1969).

approved by Laitram or occurring after the Laitram patent has expired) of its deveiners "throughout the United States." The patent provisions taken in conjunction with the judgment below also entitle Laitram to the injunction it has received prohibiting Deepsouth from continuing to "make" or once made, to "sell," deveiners "throughout the United States." Further, Laitram may recover damages for any past unauthorized use, sale or making "throughout the United States." This much is not disputed.

But Deepsouth argues that it is not liable for every type of past sale and that a portion of its future business is salvagable. Section 154 and related provisions obviously are intended to grant a patentee a monopoly only over the United States market; they are not intended to grant a patentee the bonus of a favored position as a flagship company free of American competition in international commerce. Deepsouth, barred from itself using its deveining machines, or from inducing others to use them "throughout the United States," barred also from making and selling the machines in the United States seeks to make the parts of deveining machines, to sell them to foreign buyers, and to have the buyers assemble the parts and use the machines abroad.⁵ Accordingly, Deepsouth seeks judicial approval, expressed through a modification or interpretation of the injunction against it, for continuing its practice of shipping deveining equipment to foreign customers in three separate boxes, each containing only parts of the one and three quarter ton machines, yet the whole assemblable in less than one hour.⁶ The company contends that by this means both the "making" and the "use" of the machines occur abroad and Laitram's lawful monopoly over the making and use of the machines throughout the United States is not infringed.

Laitram counters that this course of conduct is based upon a hyper-technical reading of the patent code which it tolerated will deprive it of its right to the fruits of the inventive genius of its assignors. "The right to make can scarcely be made plainer by definition . . ." *Bauer v. O'Donnell*, 229 U.S. 1, 10 (1913). Deepsouth in all respects save final joinder of the parts "makes" the invention. It does so with the intent of having the foreign user effect the combination without Laitram's permission. Deepsouth sells these components as though they were the machines themselves; the act of assembly is regarded, indeed advertised, as of no importance.

The District Court, faced with this dispute, noted that three prior circuit courts had considered the meaning of "making" in this context and that all three had resolved the question favorably to Deepsouth's position. See *Hewitt-Robins, Inc. v. Link-Belt Co.*, 371 F. 2d 225 (CA7 1966), *Cold Metal Process Co. v. United Eng'g Foundry Co.*, 235 F. 2d 224 (CA3 1956), and *Radio Corporation of America v. Andrea*, 79 F. 2d 626 (CA2 1935). The District Court held that its injunction should not be read as prohibiting export of the elements of a combination patent even when those elements could and predictably would be combined to form the whole.

"It may be urged that [this] result is not logical. . . . But it is founded on twin notions that underlie the patent laws. One is that a combination patent protects only the combination. The other is that monopolies—even those conferred by patents—are not viewed with favor. These are logic enough." *The Laitram Corp. v. Deepsouth Packing Co., Inc.*, 310 F. Supp. 926, 929 (1970).

The Fifth Circuit Court of Appeals reversed, thus departing from the established rules of the Second, Third, and Seventh Circuits. In the Fifth Circuit panel's opinion, those previous courts which considered the question "worked themselves into . . . a conceptual box" by adopting "an artificial, technical construction" of the patent laws, a construction, moreover, which in the opinion of the panel, "[subverted] the Constitutional scheme of promoting (the Prog-

⁵ Deepsouth is entirely straight-forward in indicating that its course of conduct is motivated by a desire to avoid patent infringement. Its president wrote a Brazilian customer:

"We are handicapped by a decision against us in the United States. This was a very technical decision and we can manufacture the entire machine without any complication in the United States, with the exception that there are two parts that must not be assembled in the United States, but assembled after the machine arrives in Brazil."

Quoted in *Laitram Corp. v. Deepsouth Packing Co.*, 443 F. 2d 928, 938 (CA5 1971).

⁶ As shipped, Deepsouth's tumbler contains a deveining belt different from Laitram's support member and lip. But the Laitram elements are included in a separate box and the Deepsouth tumbler is made to accommodate the Laitram elements. The record shows that many customers will use the machine with the Laitram parts.

ress of Science and the useful Arts)" by allowing an intrusion on a patentee's rights, 443 F. 2d 936, 938-939 (1971), citing U.S. Constitution, Art. I, § 8.

III. We disagree with the Fifth Circuit Court of Appeals.⁷ Under the common law the inventor had no right to exclude others from making and using his invention. If Laitram has a right to suppress Deepsouth's export trade it must be derived from its patent grant, and thus from the patent statute.⁸ We find that 35 U.S.C. § 271, the provision of the patent laws on which Laitram relies, does not support its claim.

Certainly if Deepsouth's conduct were intended to lead to use of patented deveiners inside the United States its production and sales activity would be subject to injunction as an induced or contributory infringement. But it is established that there can be no contributory infringement without the fact or intention of a direct infringement. "In a word, if there is no [direct] infringement of a patent there can be no contributory infringer." *Mercoind Corp. v. Mid-Continent Co.*, 320 U.S. 661, 667 (1944) (Justice Frankfurter dissenting on other grounds). *Aro Manufacturing v. Convertible Replacement Top Co.* 365 U.S. 336, 341-342 (1961), succinctly articulates the law:

"It is plain that § 271(c)—a part of the Patent Code enacted in 1952—made no change in the fundamental precept that there can be no contributory infringement in the absence of a direct infringement. That section defines contributory infringement in terms of direct infringement—namely the sale of a component of a patented combination or machine for use 'in an infringement of such patent.'"

The statute makes it clear that it is not an infringement to make or use a patented product outside of the United States. 35 U.S.C. § 271. See also *Dowagiac Mfg. v. Minnesota Moline Plow Co.*, 235 U.S. 641, 650 (1915), *Brown v. Duchesne*, 19 How. (60 U.S.) 183 (1856). Thus in order to secure the injunction it seeks Laitram must show a § 271(a) direct infringement by Deepsouth in the United States, that is, that Deepsouth "makes," "uses," or "sells" the patented product within the bounds of this country.

Laitram does not suggest that Deepsouth "uses" the machines. Its argument that Deepsouth sells the machines—based primarily on Deepsouth's sales rhetoric and related indicia such as price⁹—cannot carry the day unless it can be shown that Deepsouth is selling the "patented invention." The sales question thus resolves itself into the question of manufacture: did Deepsouth "make" (and then sell) something cognizable under the patent law as the invention, or did it "make" (and then sell) something which fell short of infringement?

The Court of Appeals, believing that the word "makes" should be accorded "a construction in keeping with the ordinary meaning of that term," 443 F. 2d, at 938, held against Deepsouth on the theory that "makes" "means what it ordinarily connotes—the substantial manufacture of the constituent parts of the machine." *Id.*, at 939. Passing the question of whether this definition more closely corresponds to the ordinary meaning of the term than that offered by Judge Swan in *Andrea* 35 years earlier (some thing is made when it reaches the state of final "operable" assembly), we find the Fifth Circuit's definition unacceptable because it collides head-on with a line of decision so firmly embedded in our patent law as to be unassailable absent a congressional recasting of the statute.

We cannot endorse the view that the "substantial manufacture of the constituent parts of a machine" constitutes direct infringement when we have so often held that a combination patent protects only against the operable assembly of the whole and not the manufacture of its parts. "For as we pointed out

⁷ For simplicity's sake, we, like the lower courts, will discuss only Deepsouth's claim as to permissible future conduct. It is obvious, however, that what we say as to the scope of the injunction in Laitram's favor applies also to the calculation of damages which Laitram may recover.

⁸ "But the right of property which a patentee has in his invention, and his right to its exclusive use, is derived altogether from these statutory provisions; and this court have always held that an inventor has no right of property in his invention, upon which he can maintain a suit, unless he obtains a patent for it, according to the Acts of Congress; and that his rights are to be regulated and measured by these laws, and cannot go beyond them." *Brown v. Duchesne*, 19 How. (60 U.S.) 183, 195 (1856).

⁹ Deepsouth sold the less than completely assembled machine for the same price as it had sold fully assembled machines. Its advertisements, correspondence, and invoices frequently referred to a "machine" rather than to a kit or disassembled parts. See respondents brief, pp. 8-11.

in *Mercoid v. Mid-Continent Investment Co.*, [320 U.S. 661, 676] . . . a patent on a combination is a patent on the assembled or functioning whole, not on the separate parts." *Mercoid Corp. v. Minneapolis Honeywell Regulator Co.*, 320 U.S. 680, 684 (1944). See also *Leeds and Catlin Co. v. Victor Talking Machine Co.*, 213 U.S. 301:

"A combination is a union of elements, which may be partly old and partly new, or wholly old or wholly new. But whether new or old the combination is a means—an invention—distinct from them. *Id.*, 318.

* * * * *

"[O]ne element is not the combination. Indeed, all the elements are not. To be that,—to be identical with the invention of the combination,—they must be united by the same operative law." *Id.*, at 320.

And see *Brown v. Guild*, 90 U.S. 181 (1874). In sum,

"[I]f anything is settled in the patent law, it is that the combination patent covers only the totality of elements in the claim and that no element, separately viewed, is within the grant. *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 344 (1961)."

It was this basic tenet of the patent system which led Judge Swan to hold in the leading case, *Radio Corp. of America v. Andrea*, 79 F. 2d 626 (1935), that unassembled export of the elements of an invention did not infringe the patent.

"[The] relationship is the essence of the patent. . . . No wrong is done the patentee until the combination is formed. His monopoly does not cover the manufacture or sale of separate elements capable of being, but never actually, associated to form the invention. Only when such association is made is there a direct infringement of his monopoly, and not even then if it is done outside the territory for which the monopoly was granted." *Id.*, at 628.

See also *Cold Metal Process Co. v. United Engineer and Foundry Co.*, 235 F. 2d 224, 230 (CA3 1956) ("We are in full accord with the rule thus laid down in the *Andrea* case and we think that the master and the District Court were right in applying it here"). *Hewitt-Robins Inc. v. Link Belt Co.*, 371 F. 2d 225, 229 (CA7 1966) (to the same effect).

We reaffirm this conclusion today.

IV. It is said that this conclusion is derived from too narrow and technical an interpretation of the statute and that this Court should focus on the constitutional mandate

* * * * *

"To Promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries. . . . Art. I, § 8.

and construe the statute in a manner that would, allegedly, better reflect the policy of the framer.

We cannot accept this argument. The direction of Art. I is that *Congress* shall have the power to promote the progress of science and the useful arts. When, as here, the Constitution is permissive, the sign of how far Congress has chosen to go can come only from Congress. We are here construing the provisions of a statute passed in 1952. The prevailing law in this and other courts as to what is necessary to show a patentable invention when a combination of old elements is claimed was clearly evident from the cases when the Act was passed; and at that time *Andrea*, representing a specific application of the law of infringement with respect to the export of elements of a combination patent, was 17 years old. When Congress drafted § 271, it gave no indication that it desired to change either the law of combination patents as relevant here or the ruling of *Andrea*.¹⁰ Nor has it on any more recent occasion indicated that it wanted the patent privilege to run farther than it was understood to run for 35 years prior to the action of the Court of Appeals for the Fifth Circuit.

Moreover, we must consider petitioner's claim in light of this Nation's historical antipathy to monopoly¹¹ and of repeated congressional efforts to pre-

¹⁰ When § 271 was drafted and submitted to the Senate in 1952, Senator Saltonstall asked: "Does the bill change the law in any way or only codify the present patent laws?" Senator McCarran, Chairman of the Judiciary Committee, responded: "It codifies the present patent laws." 98 Cong. Rec. 9323 (July 4, 1952).

¹¹ See the discussion in *Graham v. John Deere*, 383 U. S. 1, 7ff (1966).

serve and foster competition. As this Court recently said without dissent:

"[I]n rewarding useful invention, the 'rights and welfare of the community must be fairly dealt with and effectually guarded.' *Kendall v. Winsor*, 21 How. 322, 329 (1859). To that end the prerequisites to obtaining a patent are strictly observed, and when the patent has issued the limitations on its exercise are equally strictly enforced." *Sears, Roebuck and Co. v. Stiffel Co.*, 376 U.S. 225, 230 (1964).

It follows that we should not expand patent rights by overruling or modifying our prior cases construing the patent statutes, unless the argument for expansion of privilege is based on more than mere inference from ambiguous statutory language. We would require a clear and certain signal from Congress before approving the position of a litigant who, as respondent here, argues that the beachhead of privilege is wider and the area of public use narrower, than courts had previously thought. No such signal legitimizes respondent's position in this litigation.

In conclusion, we note that what is at stake here is the right of American companies to compete with an American patent holder in foreign markets. Our patent system makes no claim to extraterritorial effect, "these acts of Congress do not, and were not intended to, operate beyond the limits of the United States," *Brown v. Duchesne*, 19 How. 183, 195 (1856), and we correspondingly reject the claims of others to such control over reject the claims of others to such control over our markets. Cf. *Boesch v. Graff*, 133 U.S. 697, 703 (1890). To the degree that the inventor needs protection in markets other than those of this country, the wording of 35 U.S.C. §§ 154 and 271 reveal a congressional intent to have him seek it abroad through patents secured in countries where his goods are being used. Respondent holds foreign patents; it does not adequately explain why it does not avail itself of them.

V. In sum: the case and statutory law resolves this case against the respondent. When so many courts have so often held what appears so evident—a combination patent can be infringed only by combination—we are not prepared to break the mould and begin anew. And were the matter not so resolved, we would still insist on a clear congressional indication of intent to extend the patent privilege before we could recognize the monopoly here claimed. Such an indication is lacking. Accordingly, the judgment of the Court of Appeals for the Fifth Circuit is reversed and the case is remanded for proceedings consistent with this opinion.

It is so ordered.

SUPREME COURT OF THE UNITED STATES

No. 71-315

Deepsouth Packing Co., Inc., Petitioner, v. The Laitram Corporation. On Writ of Certiorari to the United States Court of Appeals for the Fifth Circuit. [May 30, 1972].

MR. JUSTICE BLACKMUN, with whom THE CHIEF JUSTICE, MR. JUSTICE POWELL, and MR. JUSTICE REHNQUIST join, dissenting.

Because our grant of certiorari was limited, 404 U.S. 1037 (1972), the customarily presented issues of patent validity and infringement are not before us in this case. I necessarily accept, therefore, the conclusion that the Laitram patents are valid and that the Deepsouth deveining machine, when manufactured and assembled in the United States, is an infringement. The Court so concedes. The Court, however, denies Laitram patent law protection against Deepsouth's manufacture and assembly when the mere assembly is effected abroad. It does so on the theory that there then is no "making" of the patented invention in the United States even though every part is made here and Deepsouth ships all the parts in response to an order from abroad.

With all respect, this seems to me to be too narrow a reading of 35 U.S.C. §§ 154 and 271(a). I. In addition, the result is unduly to reward the artful competitor who uses another's invention in its entirety and who seeks to profit thereby. Deepsouth may be admixive and candid or, as the Court describes it, *ante*, at 6 n. 5, "straightforward," in its sales "rhetoric," *ante*, at 9-10, but for me that rhetoric reveals the very iniquitous and evasive nature of Deepsouth's operations. I do not see how one can escape the conclusion that the Deepsouth machine was *made* in the United States, within the meaning of the protective language of §§ 154 and 271(a). The situation, perhaps, would be different were

parts, or even only one vital part, manufactured abroad. Here everything was accomplished in this country except putting the pieces together as directed (an operation which, as Deepsouth represented to its Brazilian prospect, would "take less than one hour"), all much as the fond father does with his little daughter's doll house on Christmas Eve. To say that such assembly, accomplished abroad, is not the prohibited combination and that it avoids the restrictions of our patent law, is a bit too much for me. The Court has opened the way to deny the holder of the United States combination patent the benefits of his invention with respect to sales to foreign purchasers.

I also suspect the Court substantially overstates when it describes *Radio Corp. of America v. Andrea*, 79 F. 2d 626 (CA2 1935), as a "leading case," *ante*, at 11, and when it imputes to Congress, in drafting the 1952 statute, an awareness of *Andrea's* "prevailing law," *ante*, at 12. *Andrea* was seriously undermined only two years after its promulgation, when the Court of Appeals modified its decree on a second review. *Radio Corp. of America v. Andrea*, 90 F.2d 612 (CA2 1937). Its author, Judge Swan himself, somewhat ruefully allowed that his court was overruling the earlier decision. *Id.*, at 615. I therefore would follow the Fifth Circuit's opinion in the present case, 443 F. 2d 936 (1971), and would reject the reasoning in the older and weakened *Andrea* opinion and in the Third and Seventh Circuit opinions that merely follow it.

By a process of only the most rigid construction, the Court, by its decision today, fulfills what Judge Clark, in his able opinion for the Fifth Circuit, distressingly forecast:

"... To hold otherwise [as the Court does today] would subvert the Constitutional scheme of promoting 'the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.' U.S. Const., Art. I, § 8, Cl. 8. It would allow an infringer to set up shop next door to a patent-protected inventor whose product enjoys a substantial foreign market and deprive him of this valuable business. If this Constitutional protection is to be fully effectuated, it must extend to an infringer who manufactures in the United States and then captures the foreign markets from the patentee. The Constitutional mandate cannot be limited to just manufacturing and selling within the United States. The fringer would then be allowed to reap the fruits of the American economy—technology, labor, materials, etc.—but would not be subject to the responsibilities of the American patent laws. We cannot permit an infringer to enjoy these benefits and then be allowed to strip away a portion of the patentee's protection." 443 F. 2d, at 939.

I share the Fifth Circuit's concern and I therefore dissent.

APPENDIX C

Vanderbilt Law Review, Vol. 26, No. 1 (January, 1973)

PATENT LAW—INFRINGEMENT OF COMBINATION PATENT—A PATENTED MACHINE WHOSE PARTS ARE PRODUCED IN THE UNITED STATES IS NOT "MADE" WITHIN THE UNITED STATES WITHIN THE MEANING OF SECTION 271(A) OF THE PATENT ACT IF ITS COMPONENT PARTS ARE EXPORTED IN UNASSEMBLED FORM

Appellant, Deepsouth Packing Company, sought modification¹ of an injunction preventing it from manufacturing and exporting component parts of a shrimp-cleaning device upon which appellee, the Laitram Corporation, held a combination patent.² Appellant contended that its manufacture of the elements of a combination patent within the United States and subsequent exportation of those parts in unassembled form was not an infringement under section

¹ The injunction prevented Deepsouth from manufacturing and exporting the device in unassembled form. Appellant sought to modify the injunction so that it could export the machine in unassembled form.

² A combination patent is one in which "[n]one of the parts referred to are new, and none are claimed as new; nor is any portion of the combination less than the whole claimed as new, or stated to produce any given result. The end in view is proposed to be accomplished by the union of all, arranged and combined together in the manner described. And this combination, composed of all parts mentioned in the specification, and arranged with reference to each other, and to other parts of the [machine] in the manner therein described, is stated to be the improvement, and is the thing patented." *Deepsouth Packing Co. v. Laitram Corp.*, 406 U.S. 518, 520-21 (1972), citing *Prouty v. Ruggles*, 41 U.S. (16 Pet.) 336, 341 (1842).

271(a) of the Patent Act,³ because the patented invention itself was not "made" within the United States,⁴ and that an injunction prohibiting such practices therefore is not authorized by the Patent Act. Appellee maintained that an apparatus is made within the United States within the meaning of section 271(a) if the component parts are manufactured in the United States and exported with the intention of having the foreign user assemble those parts into the patented object. The district court found that no enjoinder patent violation had occurred and modified the injunction.⁵ The United States Court of Appeals for the Fifth Circuit reversed, applying a "substantial manufacture" test to hold that a device is considered to be "made" within the United States if its parts are produced in this country and can be transformed into the patented combination through a relatively simple assembly process.⁶ On appeal to the United States Supreme Court, *held*, reversed. Under section 271(a) of the Patent Act, an invention with a combination patent whose parts are produced in the United States is not "made" within the United States if those parts are exported in unassembled form. *Deepsouth Packing Co. v. Laltram Corp.*, 406 U.S. 518 (1972).

At common law, inventors had no legal means of excluding other manufacturers from making, using, or selling their inventions.⁷ In order to "promote the progress of the useful arts," the drafters of the Constitution provided Congress with the power to establish a patent system and to grant inventors the exclusive right to control the use of their discoveries for a limited period of time.⁸ Congress implemented this constitutional mandate early in American jurisprudence through the passage of patent acts in 1790, 1836, and 1870.⁹ Presently, the Patent Act of 1952 provides protection to patent holders from those who seek to infringe upon the rights afforded by the act.¹⁰ The protection afforded by a patent benefits both the inventor and society because it encourages the inventor to disclose his novel idea to the public and, at the same time, protects the inventor's discovery from being stolen and capitalized upon by another. In the last 50 years, however, because of the antimonopoly philosophy expressed in antitrust legislation, the courts have re-evaluated the impact of the protection provided by patent laws in general,¹¹ and have begun to construe strictly the scope of combination patents.¹² Because only the combination¹³ itself is protected by the patent laws, the public has the privilege of using, manufacturing, and selling the individual elements of the combination without violating the patentee's legal rights.¹⁴ The patent holder's monopoly has been narrowed further by the liberal attitude that the courts have taken toward a patentee's competitors who export the patented invention. Although a patent holder may exclude others from making or using the patented apparatus in the domestic market, the courts have held that domestic

³ 35 U.S.C. § 271(a) (1970): "Except as otherwise provided in this title, whoever without authority makes, uses or sells any patented invention, within the United States during the term of the patent therefor, infringes the patent."

⁴ Deepsouth was barred by Laltram's patents from selling its shrimp-cleaning machines on the American market, but it sought to avoid the patents by selling the machines to foreign buyers in subassemblies that required less than one hour for installation.

⁵ *Laltram Corp. v. Deepsouth Packing Co.*, 310 F. Supp. 926 (E.D. La 1970).

⁶ *Laltram Corp. v. Deepsouth Packing Co.*, 443 F.2d 936 (5th Cir. 1971).

⁷ Note, *The Nature of a Patent Right*, 17 COLUM. L. REV. 663 (1917).

⁸ U.S. CONST. art. I, § 8, provides that Congress shall have the power "[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries . . ."

⁹ R. CALVERT, *PATENT PRACTICE & INVENTION MANAGEMENT*, 394-404 (1964).

¹⁰ 35 U.S.C. § 251 (1970).

¹¹ E.g., *Morton Salt Co. v. G.S. Suppliger Co.*, 314 U.S. 488 (1942) (patent cannot be used to secure any monopoly beyond that contained in the patent); *IBM v. United States*, 298 U.S. 131 (1936) (the patent monopoly may not be used in disregard of the antitrust laws); *United Shoe Mach. Corp. v. United States*, 258 U.S. 451 (1922) (a patent secures the right to exclude others from making, using, or vending the thing patented without the permission of the patent holder, but it does not exempt him from regulations consistent with those rights, made by Congress in the public interest, forbidding agreements that may lessen competition or build up monopoly in interstate trade); *Faber, Contributory Infringement—A Limited Tort*, 42 CHI-KENT L. REV. 1 (1965).

¹² "For if anything is settled in the patent law, it is that the combination patent covers only the totality of the elements in the claim and that no element, separately viewed, is within the grant." *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 344 (1961); *accord*, *Merco Corp. v. Minneapolis-Honeywell Regulator Co.*, 320 U.S. 680 (1944); *Brown v. Gould*, 90 U.S. (23 Wall.) 181 (1874).

¹³ *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336 (1961); *Morton Salt Co. v. G.S. Suppliger Co.*, 314 U.S. 488 (1942).

¹⁴ E.g., *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336 (1961).

competitors do not infringe a combination patent if they merely manufacture the component parts within the United States and ship those parts overseas before assembling them into "operable" condition.¹⁵ This position was reached by construing very strictly the word "makes" in section 271(a) of the Patent Act.¹⁶ The leading case interpreting this provision of the Patent Act is the Second Circuit's decision in *RCA v. Andrea*.¹⁷ In that case, RCA had a combination patent on a type of radio receiver and Andrea began to manufacture similar radio sets for export abroad. The parts for these receivers—with the exception of vacuum tubes that were not placed in the sets prior to exportation—were manufactured and assembled by Andrea in its American plant. To make the set operable, the overseas buyer merely had to insert the vacuum tubes into the radio.¹⁸ The court held that RCA's combination patent did not cover the manufacture and sale of separate elements of the patented apparatus that never were combined to form the invention itself and that no direct or contributory infringement could occur unless the receivers were "made" operable within the United States.¹⁹ The *Andrea* case came before the Second Circuit for a second time,²⁰ because of additional evidence introduced by the plaintiff. In its final disposition of this case, the court found that prior to exportation the tubes had been inserted into the radios for testing purposes and that this constituted the requisite "combination" for holding Andrea liable for patent infringement.²¹ The court, however, did not overrule the position it had taken previously, but rather based its finding of infringement upon the factual distinction between nonassembly and temporary assembly for testing purposes.²² A number of cases with similar factual situations have arisen in the Third and Seventh Circuits since the *Andrea* decision. Based upon the underlying concepts that a combination patent protects only the combination and that monopolies conferred by patents are not to be viewed with favor,²³ these circuits have followed the "final assembly test" articulated by the court in the first *Andrea* decision, and have held that no patent infringement can occur in the absence of a complete assembly of the device within the United States.²⁴

¹⁵ *Hewitt-Robins, Inc. v. Link-Belt Co.*, 371 F.2d 225 (7th Cir. 1966) (combination patent covers only totality of elements in claim and no element, separately viewed, is within the grant), *Cold Metal Process Co. v. United Eng'r & Foundry Co.*, 235 F.2d 224 (3rd Cir. 1956) (in the case of a combination patent, the combination is not to be regarded as made until all its elements are completed); *RCA v. Andrea*, 79 F.2d 626 (2d Cir. 1935) (doctrine of contributory infringement permits elements of patented combination to be sold in the United States with intent that buyer make and use the invention abroad).

¹⁶ 35 U.S.C. § 271(a) (1970).

¹⁷ 79 F.2d 626 (2d Cir. 1935).

¹⁸ *Id.* at 627.

¹⁹ "No wrong is done the patentee until the combination is formed. His monopoly does not cover the manufacture or sale of separate elements capable of being, but never actually, associated to form the invention. Only when such association is made is there a direct infringement of his monopoly, and not even then if it is done outside the territory for which the monopoly was granted." *Id.* at 628; see *K. W. Ignition Co. v. Temco Elec. Motor Co.*, 283 F. 873 (6th Cir. 1922) (defendant held liable for patent infringement for exporting patented shock absorbers wholly made and assembled in the United States); *Computing Scale Co. v. Toledo Computing Scale Co.*, 279 F. 648 (7th Cir. 1921) (defendant not liable for exporting parts of a patented scale to Canada when parts were assembled in Canada to form the combination and sold there); *Bullock Elec. & Mfg. Co. v. Westinghouse Elec. & Mfg. Co.*, 129 F. 105 (6th Cir. 1904) (the making and selling of a single element of a patented combination, with the purpose that such element will be exported abroad and there used in combination with other elements, is not contributory infringement).

²⁰ *RCA v. Andrea*, 90 F.2d 612 (2d Cir. 1937).

²¹ The court held that the tests were made to see if the radio receivers were marketable. Because this was a commercial use, the court stated that this violated the patent. *Id.* at 614.

²² In his dissent, Judge Swan, author of the first *Andrea* decision, states: "In holding that the sale in this country of the disassembled parts of the invention for assembly and use abroad is a direct infringement, I think we overrule our prior decision . . ." *Id.* at 615 (Swan, J., dissenting).

²³ *Laitram Corp. v. Deepsouth Packing Co.*, 310 F. Supp. 926 (E.D. La. 1970).

²⁴ In *Hewitt-Robins, Inc. v. Link-Belt Co.*, 371 F.2d 225 (7th Cir. 1966), the Seventh Circuit concluded that manufacture and sale in this country of parts for a "reclaimer" device to be assembled outside the territorial limits of the United States do not fall within the purview of 35 U.S.C. § 271 (1970); therefore no patent infringement resulted. The court followed that a combination patent covers only the totality of the elements comprising the invention and that no element, separately viewed, is within the protection of the patent. The Third Circuit in *Cold Metal Process Co. v. United Eng'r & Foundry Co.*, 235 F.2d 224 (3d Cir. 1956), held that the monopoly of the patent extends only to the making of the patented device within the United States; therefore steel rolling mills manufactured in the United States, but shipped unassembled to foreign countries, did not constitute patent infringement.

In the instant decision, the Court recognized that, in enforcing the patent laws, courts must consider not only the protection of the patent holder's invention but also the preservation of competition by restricting the growth of monopoly power through the patent device.²⁵ In addition, the majority noted that, because the statute in question²⁶ clearly indicates that it is not an infringement to "make" or use a patented product outside the United States, the patentee, in order to establish a violation of the patent laws, must prove that the alleged infringer made or used the invention within the United States.²⁷ Having found that the *Andra* standard for determining when a patented apparatus is "made" within the United States represents the overwhelming weight of authority²⁸ and having concluded that existing patent rights should not be expanded in the absence of a clear directive to do so from Congress, the Court held that the export of a patented machine in less than fully assembled form does not infringe the combination patent. The dissent maintained that the Court had construed too narrowly the meaning of to "make" in section 271(a) and had erred in applying the *Andra* rule, since the status of the first *Andra* decision as controlling authority was weakened considerably by the Court's disposition of the case on rehearing. In addition, the dissent argued that the adoption of the *Andra* standard would subvert the constitutional scheme of patent protection.²⁹

Although the Court's definition of the term "made" as used in section 271(a), adequately protects the patentee when the combination is assembled completely within the United States, it affords no protection at all to the patent holder when a competitor manufactures all the elements of the combination within the United States and has them assembled abroad. Under these circumstances, the technical *Andra* rule adopted by the Court in the instant case subverts the constitutional policy of promoting the sciences and the useful arts through affording an inventor the opportunity to control the use of his discovery for a limited period of time because it allows another producer to deprive the inventor of his right to the exclusive use of his patented product when that product is traded in the international market. By basing its decision on the premise that the patent should only protect the completed machine and not its individual unassembled elements, the Court failed to recognize that the ultimate purpose of the patent laws is to protect the inventor's unique idea and not just to control the use of the physical object that is constructed from that idea. An examination of cases that involve similar factual situations but fall under the copyright laws further indicates the inappropriateness of the Court's decision.³⁰ In those cases, the courts generally proceed on the assumption that the copyright laws were designed to protect the copyright owner at the expense of the infringer and do not emphasize the anticompetitive effect of those laws.³¹ There does not appear to be any sound reason for drawing a distinction between the property rights created under the copyright laws and those created under the patent laws. Furthermore, the property right of the patent holder should be protected by giving the word "makes" an interpretation in keeping with the ordinary meaning of the term instead of a technical construction. This result could be achieved by utilizing the "substantial manufacture" test, which would involve balancing the public's right to use the constituent parts against the patent holder's right to control the use of his invention, for determining whether a patented object was made within the United States rather than the "final assembly" test that was applied in the *Andra* case. Although the substantial manufacture test is more subjective and, as such, more difficult to apply than the final assembly test, it would provide the patent holder with considerably more protection than the *Andra* rule. In addition, adoption of the final assembly test by the courts would force the American patent holder to pay patent fees and to bring infringement actions in

²⁵ See cases cited note 12 *supra*.

²⁶ 35 U.S.C. § 271 (1970).

²⁷ See note 3 *supra*.

²⁸ See note 12 *supra*.

²⁹ 406 U.S. at 532-34.

³⁰ See *Mazer v. Stein*, 347 U.S. 201 (1954).

³¹ *E.g.*, *Sheldon v. Metro-Goldwyn Pictures Corp.*, 309 U.S. 390 (1940) (defendant held liable for copyright infringement for making negatives of a motion picture here and exhibiting the positives abroad); *Famous Music Corp. v. Seeco Records, Inc.*, 201 F. Supp. 560 (S.D.N.Y. 1961) (defendant's preparation of tapes that were sent to persons abroad to be used to manufacture phonograph records containing renditions of copyrighted musical compositions violated copyright law and involved company as joint tort-feasor in "manufacture").

numerous foreign countries, whereas, under the substantial manufacture test, one court could make a final determination of the patentee's rights.

APPENDIX D

Iowa Law Review, Vol. 57, No. 3 (February, 1972)

COMMENTS—TIGHTENING THE SCREWS ON MINOR ASSEMBLIES ABROAD: THE MEANING OF "MAKES" UNDER THE PATENT INFRINGEMENT STATUTE

In the recent case of *Laitram Corp. v. Deepsouth Packing Co.*,¹ the United States Court of Appeals for the Fifth Circuit, despite directly conflicting authority in three other circuits,² upheld the validity of a company's patents for certain shrimp-deveining machinery, by ruling that a minor final assembly, in a foreign country, of an identical machine manufactured by a rival company could not escape the reach of the federal patent infringement statute, 35 U.S.C. section 271.³ This section of the patent law provides that anyone who without authority makes any patented invention within the United States during the term of the patent, infringes the patent.⁴ Since the patent laws do not prohibit the manufacture of a patented article in another country,⁵ the question of patent infringement involved in *Laitram* goes directly to the heart of what constitutes the "making of an invention within the United States."⁶

The answer to this interpretive dilemma is of paramount importance to the area of patent law. It is determinative of what comes within the reach of a patent claim and, therefore, will dictate substantial industrial policy in this Country. If "making within the United States" is construed so that a company, in order to escape liability under section 271, is permitted to manufacture the constituent elements of a patented invention leaving only a minor final assembly to be performed overseas, the result will be that the protection afforded a manufacturer, with a United States patent for inventions marketable overseas, is substantially less than that provided a manufacturer who sells a patented invention marketable solely within the United States. Thus, this interpretation of "making within the United States" will protect a manufacturer against patent infringement only where the patented invention is totally assembled within the United States prior to its sale or use in a foreign nation.

This Comment will examine the *Laitram* decision to see what it adds to the development of the legal standards of patent infringement, urge its affirmance as in accordance with the congressional mandate in enacting section 271, and discuss policy arguments as to why the interpretation of the statute, which the case advances, should be upheld. Prior to this analysis of *Laitram*, however, it will be necessary to ascertain the state of the prior case law on the issue of patent infringement in similar fact situations where an alleged infringer has manufactured the constituent elements but does not complete final assembly until after the parts were shipped to a foreign country.

As indicated, three previous decisions have considered a patent infringement issue similar to that hypothesized and each reached a result opposite to that in *Laitram*.⁷ These cases permitted a manufacturer to make the constituent elements of a patented machine in the United States, assemble the elements once they arrive overseas, and sell the assembled machine without being held in violation of section 271's prohibition against making a patented invention within the United States.⁸ Analysis of these decisions will show, however, that each reached an incorrect result in concluding that mere minor assembly of

¹ 443 F.2d 936 (5th Cir. 1971).

² *Hewitt-Robins, Inc. v. Link-Belt Co.*, 371 F.2d 225 (7th Cir. 1966); *Cold Metal Process Co. v. United Eng'r & Foundry Co.*, 235 F.2d 224 (3rd Cir. 1956); *Radio Corp. of America v. Andrea*, 79 F.2d 626 (2d Cir. 1935).

³ 443 F.2d 936, (5th Cir. 1971).

⁴ 35 U.S.C. § 271 (1970).

(a) Except as otherwise provided in this title, whoever without authority makes, uses or sells any patented invention, within the United States during the term of the patent therefor, infringes the patent. *Id.*

⁵ *E.g.*, *Brown v. Duchesne*, 60 U.S. 183, 195 (1856); *Radio Corp. of America v. Andrea*, 79 F.2d 627, 628 (2d Cir. 1935); *Bullock Elec. & Mfg. Co. v. Westinghouse Elec. & Mfg. Co.*, 129 F. 105, 109 (6th Cir.), *cert. denied*, 304 U.S. 573 (1944).

⁶ 35 U.S.C. § 271 (1970).

⁷ See authority cited note 2 *supra*.

⁸ *Id.*

the component parts in a foreign nation avoided direct infringement of the patent.

In the first of these infringement decisions, *Radio Corp. of America v. Andrea*,⁹ the defendants raised no question as to the validity or title of the plaintiff's patents.¹⁰ Nor did they dispute that they would have "directly" infringed¹¹ the plaintiff's patent if the elements which they had manufactured had been totally assembled for use in the United States.¹² Rather, the defendants contended that the patented combination they had sold was incomplete and unassembled until it was out of the jurisdiction of the United States and the reach of its patent laws.¹³ Thus, they denied direct infringement.¹⁴ Additionally they argued that since they did not fall within the doctrine of contributory infringement,¹⁵ they were not liable for infringement.¹⁶

In accepting the defendant's assertion that they did not infringe the plaintiff's patent the court relied extensively on the contributory infringement test.¹⁷ The court stressed that the defendants escaped infringement because the elements which they manufactured had not been completely assembled within the United States, since they were shipped overseas for assembly.¹⁸ Thus, the court apparently adopted the theory that a manufacturer could escape infringement merely by sending the elements of the patented combination to a foreign country to be assembled even if it had the intent that the element be used there in combination with the other elements of the original patented invention.¹⁹

Even though the *Andrea* court held that there was neither direct nor contributory infringement, the ruling was substantially undermined in a modified opinion by the same court when confronted with the same fact situation.²⁰ At this second trial²¹ (*Andrea II*) new facts were admitted into evidence which showed that the component elements had been assembled for testing purposes in the United States and then disassembled for shipment overseas.²² Although the *Andrea II* court appeared to put major emphasis on the fact that the defendant had assembled the constituent elements in order to test the machine before shipment, it nevertheless explicitly recognized that the contributory infringement doctrine relates only to the aiding of another person by the sale of an element of the patented combination.²³ The doctrine does not apply to the sale by a single manufacturer of all of the elements of the machine which are to be assembled abroad.²⁴ The modified decision recognized, therefore, that the doctrine of contributory infringement was totally irrelevant to a factual situation where all of the constituent parts of a patented combination were shipped to a foreign nation for mere minor final assembly there.²⁵ Based upon this analysis, it is readily apparent that the contributory infringement test is also irrelevant to the facts in the *Laitram* case since, in that case, more than a single element of a patented combination was manufactured by DeepSouth.²⁶

⁹ 79 F.2d 626 (2d Cir. 1935).

¹⁰ *Id.* at 627.

¹¹ To constitute direct infringement "It is essential that there be present in the infringing device or combination every element of such [patent] claim . . . so combined as to produce substantially the same result operating in substantially the same way." *Safety Car Heating & Lighting Co. v. Gould Coupler Co.*, 230 F. 848, 851 (D.C.N.Y. 1916).

¹² *Radio Corp. of America v. Andrea*, 79 F.2d 626, 627 (2d Cir. 1935).

¹³ *Id.*

¹⁴ *Id.*

¹⁵ 35 U.S.C. § 271(c) (1970).

(c) Whoever sells a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same part to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity suitable for substantial noninfringing use, shall be liable as a contributory infringer. *Id.*

¹⁶ *Radio Corp. of America v. Andrea*, 79 F.2d 626, 627 (2d Cir. 1935).

¹⁷ *Id.* at 628-29.

¹⁸ *Id.* at 628.

¹⁹ More recent decisions have stated that there can be no contributory infringement without a direct infringement. 35 U.S.C. § 271(c) (1970); *Aro Mfg. Co., Inc. v. Convertible Top Replacement Co., Inc.*, 365 U.S. 336, 341 (1961); *Mercol Corp. v. Mid-Continent Inv. Co.*, 320 U.S. 661, 677 (1944) (Frankfurter, J. dissenting).

²⁰ *Radio Corp. of America v. Andrea*, 90 F.2d 612 (2d Cir. 1937).

²¹ *Id.*

²² *Id.* at 613.

²³ *Id.* at 614.

²⁴ *Id.*

²⁵ *Id.*

²⁶ *Laitram Corp. v. DeepSouth Packing Co.*, 443 F.2d 936, 937 (5th Cir. 1971).

To further undermine the precedential value of *Andrea I*, the *Andrea II* court went on to state explicitly that if the components of a patented invention are sold in a substantially unified and combined form, direct infringement cannot be avoided by leaving a minor final integration to the purchaser.²⁷ This statement describes the exact situation which was presented to the *Laitram* court. After an injunction was issued which prohibited Deepsouth and its affiliate Skrimetta Machinery Corporation from "making, using, or selling the infringing apparatus,"²⁸ Skrimetta subsequently wrote a prospective foreign customer as follows:

We are handicapped by a decision against us in the United States. This was a very technical decision and we can manufacture the entire machine without any complication in the United States, with the exception that there are two parts that must not be assembled in the United States, but assembled after the machine arrives in Brazil. This assembly will take less than one hour.²⁹

It is obvious then that the Court of Appeals for the Fifth Circuit in deciding *Laitram* must have recognized that it was the clear intent of Deepsouth and its affiliate company Skrimetta to try to use a technicality of minor assembly overseas to escape the protection given to the original patentee by the United States patent laws. The Fifth Circuit thus correctly recognized that regardless of whether the dyeing machine had been assembled for testing purposes, it was the expectation of the foreign customer when it paid Skrimetta Machinery Corporation in United States currency that it would receive a "complete machine" not just a component part or parts. Therefore, in reality, Deepsouth was selling Laitram's patented machine with the commercial result for Laitram of the deprivation of a possible sale on a machine which, according to its patent, it had the right to exclude others from making and selling in the United States.³⁰

There are only two other cases which deal with the infringement issues presented in the *Andrea* and *Laitram* cases. In *Cold Metal Process Co. v. United Engineering & Foundry Co.*,³¹ the Third Circuit followed the first *Andrea* case stating:

We are in full accord with the rule thus laid down in the *Andrea* case and we think that the master and the district court were right in applying it here. Its force, in our view, is not impaired by the later opinion of the court after final hearing in the same case . . . which held that the defendant had infringed the combination patent there sued on in view of evidence that the radio sets in question had been completely assembled in this country and tests of operation made after which they were disassembled and shipped to purchasers abroad. We do not quarrel with the conclusion of the court that such assembling and testing constituted a making and use of the patented combination in this country. In the present case, however, no such assembling or testing in this country took place. Accordingly, the rule laid in the first *Andrea* opinion applies here rather than that stated in the second.³²

Therefore, the Third Circuit in *Cold Metal* was merely following what has already been shown as an incorrect reading of the *Andrea II* case.³³ The court in the *Andrea II* decision did not rely entirely on the testing aspect of the assembly to hold that the manufacturing involved constituted infringement.³⁴ This latter decision in the case recognized that direct infringement could not be avoided by a separation or division of parts which leaves to the purchaser a simple task of integration.³⁵

The last of the cases which deals directly with the patent question raised in *Laitram* is *Hewitt-Robins, Inc. v. Link-Belt Co.*³⁶ which involved substantial, not merely minor, assembly overseas.³⁷ In that case the Seventh Circuit stated that:

²⁷ *Radio Corp. of America v. Andrea*, 90 F.2d 612, 613 (2d Cir. 1937).

²⁸ *Laitram Corp. v. Deepsouth Packing Co.*, 443 F.2d 936, 938 (5th Cir. 1971).

²⁹ *Id.*

³⁰ Although none of the cases concerned with the activity dealt with in this Comment consider the infringement of a patent by "selling" the manufactured parts that are not completely assembled, this activity is also prohibited if done within the United States, 35 U.S.C. § 271(a) (1970).

³¹ 235 F.2d 224 (3rd Cir. 1956).

³² *Id.* at 230.

³³ See text accompanying notes 19-29 *supra*.

³⁴ *Radio Corp. of America v. Andrea*, 90 F.2d 612, 613 (2d Cir. 1937).

³⁵ *Id.*

³⁶ 317 F.2d 225 (7th Cir. 1966).

³⁷ See *id.* at 227-28.

If anything is settled in the patent law, it is that a combination patent covers only the totality of the elements in the claim and that no element, separately viewed, is within the grant . . . We deem it equally clear that unassembled elements of a combination patent do not constitute the "patented invention."³⁸

There was no cited authority, however, to substantiate the second statement. The Court relied entirely on the decisions in *Andrea I* and *Cold Metal*, merely quoting from them with no new analysis. Thus, *Hewitt-Robins* rests solely upon the precedential value of *Andrea I* and *Cold Metal*. As the prior analysis has shown, it may be strongly argued that the precedential weight of these cases decided before *Laitram* is of little value.³⁹ *Cold Metal* and *Hewitt-Robins* relied upon the analysis used by the Second Circuit in the *Andrea I* case.⁴⁰ These cases, however, failed to consider the fact that the holding in *Andrea I* was substantially undermined by the modified opinion of *Andrea II* which dealt with the same factual situation and which pointed out the inapplicability of the infringement analysis used by the court in *Andrea I*.

By considering, in *Laitram*, the economic reality of DeepSouth's manufacture of the constituent elements of the deveining machine and subsequent sale to a foreign company for minor final assembly, the Court of Appeals for the Fifth Circuit not only correctly interpreted case-law precedent, but also followed the legislative intent and history behind section 271 of the patent statute.⁴¹ In order to prove direct infringement under section 271(a) the patentee must prove that the alleged infringer "makes" the article within the United States.⁴² The controversy turns around what definition Congress intended to be given "makes"; a technical one of complete and full assembly, or a realistic one of completed manufacture of constituent parts with only minor final assembly remaining, as was DeepSouth's practice.

In this analysis of congressional intent it is important to note that section 271 is a new section which was not in force when the two *Andrea* cases were decided.⁴³ Prior to that time there was no congressional declaration of what constituted infringement under the old statutes.⁴⁴ Although *Cold Metal* and *Hewitt-Robins* were decided after the statute was passed in 1952, neither discussed the impact of the new statute but merely followed the decision reached in the *Andrea I* case.⁴⁵ Therefore, *Laitram* is the first independent analysis of the scope of the patent statute.

Considering this state of affairs together with an analysis of the legislative history behind section 271, reveals that the decision reached in the *Laitram* case represents an attempt by the Fifth Circuit to follow the congressionally expressed mandate of expanding the protection against patent infringement. The legislative documents concerned with section 271(a) evidence an intent by Congress to implement a more realistic infringement policy than that laid down in *Andrea I* and followed in *Cold Metal* and *Hewitt-Robins*. The senate reports on the legislative hearing expressly declare that, because there had been a number of conflicting and contradictory decisions in the infringement area, Congress felt it was necessary to codify the principles of patent infringement which most effectively aid the purpose for patents.⁴⁶ This congressional purpose was to extend the scope of the right to exclude infringers from making, using, or selling the patented invention for the duration of the patent.⁴⁷

Specific evidence supporting this congressional expression of protection against patent infringement is offered by section 271's contributory infringement provisions.⁴⁸ It is clear from the hearings on section 271 that Congress

³⁸ *Id.* at 229.

³⁹ See text accompanying notes 19-29, 30-34 *supra*.

⁴⁰ See *Hewitt-Robins, Inc. v. Link-Belt Co.*, 371 F.2d 225 (7th Cir. 1966); *Cold Metal Process Co. v. United Engr' & Foundry Co.*, 235 F.2d 224 (3rd Cir. 1956).

⁴¹ 35 U.S.C. § 271 (1971).

⁴² 35 U.S.C. § 271 (1970).

⁴³ Act of July 19, 1952, Pub. L. No. 593, ch. 28, § 271, 66 Stat. 811 (1952).

⁴⁴ H.R. MISC. REP. No. 1923, 82d Cong., 2d Sess. 9 (1952).

⁴⁵ See text accompanying notes 30-39 *supra*.

⁴⁶ S. MISC. REP. No. 1979, 82d Cong., 2d Sess. 8 (1952).

⁴⁷ See *id.*

⁴⁸ 35 U.S.C. §§ 271(c), (d) (1970).

specifically rejected a number of court decisions which had severely limited the doctrine of contributory infringement.⁴⁹ Despite the fact that it was specifically pointed out to Congress that the proposed provisions were contrary to prior case law which had limited the doctrine,⁵⁰ section 271 was passed without amendment.⁵¹ Thus, it is readily apparent from this passage of section 271 that Congress intended to broaden the protection offered a patentee against contributory infringement.

In keeping with this congressional protection against infringement is the reasonable inference that if Congress had not intended to codify the decision reached in *Andrea II*, they would have specifically passed a provision which would have overruled that decision. As evidenced by its treatment of contributory infringements, when Congress intended to overturn the existing law they passed a specific statute to accomplish that purpose. This failure, however, to overrule the existing law of the *Andrea II* case is additional evidence of congressional acceptance of its expressed treatment of the problem of the manufacture of constituent elements with a mere minor assembly abroad.⁵² Thus, it is reasonable to conclude that *Laitram* was the correct interpretation of direct patent infringement which Congress wished to codify when they passed section 271.

However, even if the legislative intent arguments concerning contributory infringement and its effect on the direct infringement of section 271⁵³ are ignored, any policy need to protect the public's right to be able to use the ordinary and staple constituent elements of a patented machine does not justify the activity involved in *Laitram*.⁵⁴ This need to protect the public's right to constituent parts would be an inappropriate and inadequate defense to an infringement by DeepSouth. The defendants did not manufacture one or even two of the constituent elements to be used independently from the patented invention. Instead, they manufactured the entire machine.⁵⁵ DeepSouth merely failed to assemble the parts into a whole within the United States in an attempt to escape the protection offered to the original patentee, *Laitram*, by the patent law.⁵⁶ Therefore, the policy of making the independent elements of a patented machine available to the public is of no relevance to activities such as DeepSouth's.

⁴⁹ *Hearings on H.R. 3760 Before Subcomm. No. 3 of the House Comm. on the Judiciary*, 82nd Cong., 1st Sess., ser. 9, at 159 (1951). To fully understand how Congress intended to clarify this situation, however, it is necessary to understand the pre-1952 case law on how the doctrine of contributory infringement developed. The doctrine made its appearance in *Whitney v. New York Scaffolding Co.*, 224 F. 452 (8th Cir.), *cert. denied*, 239 U.S. 640 (1915). This case held that one who makes and sells one element of a patented combination, with the intention and for the purpose of bringing about its use in a patented combination is guilty of contributory infringement, and is equally liable with the one who in fact organizes the completed combination. *Id.* at 459. Therefore, the intent of the manufacturer is the decisive factor in showing a contributory infringement. However, the doctrine of contributory infringement is limited to situations where the articles sold were either components of a patented invention, or had no independent use from the patented combination, or were so used as to constitute infringement. *Cortelyou v. Charles E. Johnson & Co.*, 145 F. 933, 934-35 (2d Cir. 1906). It has not been extended to apply to ordinary and staple articles of commerce used in connection with the patented machine; either by case law, *id.* at 935, or by the present statute, 35 U.S.C. § 271(c) (1970). Thus, an article which has a use independent of its use in the patented invention would not fall within the contributory infringement doctrine unless sold with the intent that it be used in the patented invention.

In 1944, the Court in *Mercoid Corp. v. Mid-Continent Inv. Co.*, 320 U.S. 661 (1944), however, completely destroyed the significance of the doctrine of contributory infringement. That case held that the owner of a system patent may not use it to secure a limited monopoly of an unpatented device employed in practicing the invention even though the unpatented device is itself an integral part of the patented system and has no use independent of the patented combination. *Id.* at 665. Thus even if another company manufactured the unique and vital components of a patented machine, they could escape infringement after the *Mercoid* decisions, as long as they did not manufacture all of the elements of the patented invention. No longer was intent to manufacture and sell an integral component of a patented combination in violation of the contributory infringement doctrine. The *Mercoid* rule was still in effect and being followed by some of the lower courts when Congress resurrected the doctrine of contributory infringement in section 271(c). See *Stokes & Smith Co. v. Transparent-Wrap Mach. Corp.*, 156 F.2d 198 (2d Cir. 1946); *Stroco Prods., Inc. v. Mullenbach*, 67 U.S.P.Q. 168 (S.D. Cal. 1944).

⁵⁰ *Id.* at 158-62.

⁵¹ *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 378 n.7 (1961) (Harlan, J., dissenting).

⁵² *Radio Corp. of America v. Andrea*, 90 F.2d 612, 613 (2d Cir. 1937).

⁵³ 35 U.S.C. § 271(a) (1970).

⁵⁴ See 35 U.S.C. § 271(c) (1970); *Laitram Corp. v. DeepSouth Packing Co.*, 443 F.2d 936, 939 (5th Cir. 1971).

⁵⁵ 443 F.2d at 937-38.

⁵⁶ *Id.*

Another basic policy consideration which militates against allowing a manufacturer such as Deepsouth to use the technicality of minor final assembly abroad in order to avoid the patent-infringement laws is that this would destroy the purpose behind the protection afforded by the patent laws. The patent laws are designed to assure the patentee the privilege of excluding infringers from making, using, or selling the patented invention for the duration of the patent.⁵⁷ If the technicality of minor final assembly abroad is permitted, the patentee would be effectively deprived of its exclusive sales privilege.⁵⁸ An infringer, such as Deepsouth, would be able to manufacture all of the component parts of the patented machine with the intent that they be used to form the patented invention. Even though the machine is essentially manufactured solely within the United States, mere assembly in a foreign country would avoid the prohibition of section 271. Consequently, the patentee's rights are substantially diminished with regard to machines made within the United States; a result the patent laws are designed to prevent.

Patent law commentators agree with these arguments supporting the congressional policy that realistically a combination is "made within the United States" when all of its components are finished and ready to be united in a final assembly.⁵⁹ Thus, according to these authorities, Deepsouth and its affiliate would more than meet the definition of "makes" by their activities of manufacturing the entire machine and leaving only final assembly of two parts.⁶⁰

In light of these considerations, the Court of Appeals in the *Laitram* case correctly recognized the reality of the transaction in which Deepsouth used the technical point of nonassembly in final form to deprive the original patentee of the protection offered by the United States patent law. Previous conflicting case law in this area can be effectively distinguished. The Third and Seventh Circuits in *Cold Metal* and *Hewitt-Robins* presented no new analysis and merely followed the original case in this area—*Radio Corporation of America v. Andrea*.⁶¹ This case failed to take into account the commercial results of the activity involved and relied upon an inappropriate application of the doctrine of contributory infringement. Furthermore, in a second opinion the *Andrea* court distinguished the line of cases used in the first opinion to support the result reached and stated that if the elements of the invention are sold in substantially unified and combined form, infringement is not avoided by packaging the parts together and leaving a minor final assembly to the foreign purchaser.⁶²

In refusing to follow the previous decisions of the Second, Third, and Seventh Circuits, the Fifth Circuit realized that section 271 was expressive of a congressional intent to explicitly provide extensive protection against patent infringement. By effecting a liberal interpretation of what constitutes "makes," the court only reinforces substantial arguments related to legislative intent which reveal a desire against infringement afforded by Congress to extend the protection the patentee. In balancing the need to protect the patentee and the right of the public to utilize the unpatented constituent elements of the patented machine, the Fifth Circuit correctly decided that the public's right extends only to those cases where the elements are ordinary and staple articles of commerce or are elements manufactured for other legitimate purposes. The intent and knowledge can not be to manufacture the patented machine in its entirety and leave only a minor assembly operation in order to escape the protection offered to the original patentee by the infringement statute. While the law as expounded in *Laitram* remains the minority view in the circuits, it articulates the sounder policy in this narrow but important area of patent law and should be adopted and followed as the better rule.

STATEMENT OF THE SOCIETY OF PATENT CLASSIFIER

The Society of Patent Classifiers is the professional organization of substantially the entire force in the U.S. Patent Office concerned with the administration and creation of patent search systems. The Society has 63 members. Our

⁵⁷ U.S. CONST. art. I, § 8(8); 35 U.S.C. § 154 (1970).

⁵⁸ See *Laitram Corp. v. Deepsouth Packing Co.*, 443 F.2d 936, 939 (5th Cir. 1971).

⁵⁹ 3 W. ROBINSON, THE LAW OF PATENTS § 924, at 101 (1890); see H. TOULMIN, HANDBOOK OF PATENTS 613-14 (1954).

⁶⁰ *Laitram Corp. v. Deepsouth Packing Co.*, 443 F.2d 936, 938 (5th Cir. 1971).

⁶¹ 79 F.2d 626 (2d Cir. 1935).

⁶² *Radio Corp. of America v. Andrea*, 90 F.2d 612, 613 (2d Cir. 1937).

comments are limited to section 6 of the bill, other sections being outside the immediate focus of the Society.

In general, we approve of the terminology "The Commissioner shall. . ." which appears in all paragraphs of this section. This is an improvement over the merely permissive terminology employed in the present law.

Section 6, paragraph (a) is satisfactory.

In paragraph (b), we believe that both appearances of the term "without charge" should be stricken. So much material may be required of the Patent Office by other agencies that the transactions would be a significant burden on the Patent Office budget. The beneficiary of the materials should bear the burden of the cost.

In regard to section 6, paragraph (c), we have no position on the substantive issue of whether abandoned patent applications should be opened to the public. However, it should be pointed out that if abandoned patent applications are to be included in the classified files of patent materials, a significant additional burden will be placed upon the Patent Office budget for reclassification projects.

Paragraph (d) provides for "satellite" search centers which would have all the facilities of the Patent Office Scientific Library as well as of the Patent Office Public Search Room. We favor the establishment of such centers, but the materials of such centers should be restricted to patent materials only. We do not believe it to be necessary or feasible for the Patent Office to duplicate scientific library facilities which exist elsewhere in the country. Therefore, we urge that the term "prior art and" be stricken from each of the three sentences of this paragraph. Also, in the second sentence, after the expression "complete and current," all of the rest of the sentence should be stricken.

Section 6, paragraph (e) should be clarified. It should be made clear that any mechanized systems adopted by the Patent Office for its own use should be made available to the public for its use. We do believe, further, that the results of search system research projects should be made known to the public.

In conclusion, we request that the Society of Patent Classifiers be given early notice of further public hearings in matters of patent legislation so that oral testimony may be given.

Respectfully submitted,

I. J. ROTKIN, *President.*

SEPTEMBER 20, 1973.

SENATOR JOHN L. MCCLELLAN,
U.S. Senate,
Washington, D.C.

DEAR SENATOR MCCLELLAN: The undersigned individuals, who represent all of the living former United States Commissioners of Patents, are deeply concerned about the erosion of the status of the United States Patent System. While there are many reasons for this deterioration, the purpose of this letter is to focus on one major step that should be taken at the earliest possible moment in order to help reverse the present unfavorable trend.

More particularly, it is the unanimous recommendation of the undersigned former Commissioners that it is essential to the future of the United States Patent System and our country that the voice of the Patent System be elevated in the Executive Branch of the Federal Government. From the beginnings of our country when the patent system was administered personally by Thomas Jefferson to the present time, history has demonstrated that the incentives of the patent system have brought forth a stream of inventions which have contributed substantially in making our country the greatest and strongest in the world. However, now all the warning signs indicate that the incentives for invention and innovation have been waning in the country, in large part due to the erosion of the incentives originally contemplated by the founders of our country.

There have been a number of specific proposals made in recent years for increasing the effectiveness of the voice for the patent system in the organizational structure of the Government, such as by making the Patent Office an independent agency, designating the position of Commissioner of Patents as that of an Assistant Secretary of Commerce, establishing a new position of Assistant Secretary of Commerce for Invention and Intellectual Property and others. The purpose of this letter is not to recommend adoption of any particu-

lar one of these specific proposed organizational changes since we have not been able to reach a unanimous agreement in support of any particular one of them. However, we wish to unanimously endorse a certain step that we believe is the least that should be taken to restore the voice and influence of the United States Patent System to its former position of eminence in the government.

More particularly, we strongly recommend that, as a minimum, the position of Commissioner of Patents be elevated to at least the level of an Assistant Secretary of Commerce and preferably to the level of an Under Secretary of Commerce so that the Commissioner would no longer be required to report to the Assistant Secretary of Commerce for Science & Technology. This proposed organizational change would then be similar to the change made several years ago in the status of the Weather Bureau in the Department of Commerce. A similar change in the case of the Patent Office, we believe, would increase the effectiveness of the operation of the Patent Office and eliminate some of the problems that have arisen from time to time as a result of the present organizational structure.

Sincerely yours,

CONWAY P. COE (1933-45)
ROBERT C. WATSON (1953-61)
DAVID L. LADD (1961-63)
EDWARD J. BRENNER (1964-69)
WILLIAM E. SCHUYLER, JR. (1969-71).
ROBERT GOTTSCHALK (1971-73).

U.S. PATENT OFFICE,
SUPERVISORY PRIMARY EXAMINERS-CLASSIFIED ORGANIZATION,
Washington, D.C., September 27, 1973.

HON. JOHN L. MCCLELLAN, *Chairman, Senate Subcommittee on Patents, Trademarks & Copyrights, Old Senate Office Building, Washington, D.C.*

Dear SENATOR MCCLELLAN: We solicit favorable consideration from the Subcommittee of the amendments to S. 1321 which we are proposing, a copy of which is enclosed.

Our organization includes in its membership about 75 out of 78 supervisory primary examiners in the Patent Office. The proposed amendments are directed primarily to defining and improving the status of these examiners. (It may be noted that the number of supervisory primary examiners has dropped sharply in recent years and it appears to be an object of the Office to reduce the number still further).

While there is presently no statutory definition of a primary examiner, the current usage in the Patent Office is to apply this term to any examiner having full signatory authority, that is, the authority to sign final rejections and allowances. The supervisory primary examiners, all of whom are in grade 15, supervise the other primary examiners, some of whom are also in grade 15 but most of whom are in grade 14, as well as assistant examiners of lower grades. Each supervisory primary examiner is in charge of an Art Unit, having on the average about 15 examiners each.

Our organization is, in general, pleased with the descriptions contained in sections 131 to 136 of S. 1321 of both the present duties and the proposed expanded duties of the primary examiners. This is in welcome contrast to the existing statute which does not define these duties at all. However, we note that S. 1321, like the existing statute, lacks any antecedent definition of the term, "primary examiner".

The proposed amendments are intended mainly to supply this deficiency. This is the intent of proposed section 5.1, which is modelled after section 5 of the bill, which defines the status of the examiners-in-chief.

In addition certain changes have been proposed to section 5(a) and also incorporated in proposed section 5.1(a), to remove the language "appointed . . . in the manner prescribed for administrative law judges (5 U.S.C. 3105, 5362, 7521)", which leaves it unclear whether such appointees would, in fact, be administrative law judges or who would fix their pay. (The pay of the examiners-in-chief is presently fixed by the Secretary of Commerce.) The language in proposed section 5.2 is intended to make it clear that they are not administrative law judges but are subject to the same protection with reference to the

three named sections of title 5 (5335, 7521 and 4301). This would protect the independence of the examiners-in-chief and primary examiners in their decision making functions by making applicable to them the provisions dealing with performance ratings, step increases, and removal relating to administrative law judges.

The proposed changes to section 5(e) are intended to reflect the grade maximums being proposed for primary examiners.

Proposed section 5.1 would authorize a maximum of grade 16 for primary examiners, the per annum compensation to be fixed by the Commissioner of Patents. It is intended that the Grade 16 rate would be fixed for supervisory primary examiners only. This would make possible a grade differential between them and the grade 15 non-supervisory primary examiners. It would appear to be just as logical to specify the maximum grade of primary examiners as that of examiners-in-chief, both of these positions being expressly provided for by statute. The proposed grade is believed justified by the duties spelled out in the bill.

Respectfully yours,

LEON ZITVER,
Chairman, Legislative Committee.

PROPOSED AMENDMENTS TO S. 1321 SUBMITTED BY SUPERVISORY PRIMARY
EXAMINERS AND CLASSIFIERS ORGANIZATION (SPECO)

Rewrite Section 5(a) as follows:

There shall be in the Patent Office not to exceed twenty-four Examiners-in-Chief, who shall be appointed under the competitive service. The per annum rate of basic compensation of each Examiner-in-Chief shall be fixed by the Commissioner at not in excess of the maximum scheduled rate provided for positions in Grade 17 of the General Schedule (5 U.S.C. 5104).

In section 5(e), insert "supervisory" before "primary examiner" (p.5, line 20 of the bill) and change "16" to "17" (p.5, line 29 of the bill).

Insert the following sections after Section 5:

Sec. 5.1(a) There shall be in the Patent Office such number of Primary Examiners as are necessary for the proceedings required to be conducted in accordance with Sections 131 to 136 of this Title, who shall be appointed under the competitive service. The per annum rate of basic compensation of each Primary Examiner shall be fixed by the Commissioner at not in excess of the maximum scheduled rate provided for positions in Grade 16 of the General Schedule (5 U.S.C. 5104).

(b) The Primary Examiners shall be persons of competent legal knowledge and scientific ability.

Sec. 5.2 The Examiners-in-Chief and the Primary Examiners shall be subject to the same provisions of law and regulations of the Civil Service Commission as are Administrative Law Judges appointed under Section 3105 of Title 5, United States Code, with respect periodic step increases under Section 5335; removal under Section 7521; and exclusion from performance ratings under Section 4301 of said Title.

WATSON, COLE, GRINDLE & WATSON,
Washington, D.C., September 20, 1973.

Re S. 1321.

HON. PHILIP A. HART,
*U.S. Senate,
Russell Office Building,
Washington, D.C.*

MY DEAR SENATOR HART: One of your assistants, Mr. Nash, was kind enough to send me a copy of the Bill which you introduced last March for the purpose of effecting numerous changes in our patent laws. This is to let you know that I favor quite a few of your proposals, particularly

- (1) To make the Patent Office independent of the Commerce Department;
- (2) To require patentees to pay maintenance fees;
- (3) To publish before patent issuance.

As I understand the Bill, it includes no clause or section which protects members of the Examining Staff of the Patent Office from Court attack, i.e., from being required to testify in Court with reference to proceedings which took place in the Patent Office and which resulted in the issuance of a patent.

The Bill should, in my opinion, be amended to fully protect Examiners against demands of plaintiffs or defendants engaged in patent litigation. I enclose a copy of an article which appeared in the July 1967 issue of the Journal of the Patent Office Society and call your attention to the paragraph which appears on page 39 of that article and which deals with that subject.

Also enclosed is a copy of an article written by Mr. Ray Lupo of the legal staff of the Patent Office in which the same problem is discussed. This article is well written and most persuasive, clearly having been drafted after consideration of all aspects of that problem.

It will be observed that Mr. Lupo entertains the view that Examiners should be allowed to testify, when ordered to do so, as to purely factual matters. However, it is my belief that the best long term interests of the public will be served if Examiners are not required, or permitted, to testify in Court even with respect to purely factual matters and that the examining procedure be so conducted that every material fact may be ascertained by one who studies the file wrapper of the patent involved in litigation. No attempt will be made in this letter to enumerate all of the factors which tend to support the view that Examiners should not be required to testify as witnesses in suits involving patents. Study of the "tetracycline" case to which Mr. Lupo makes reference will reveal the nature of some of the problems involved.

The purpose of this letter is to suggest that this subject be given consideration while S.1321 is pending and that appropriate action be taken.

Very truly yours,

ROBERT C. WATSON,
Commissioner of Patents 1953-61.

[The two articles referred to Journal of the Patent Office Society, July, 1967, page 39, and Journal of the Patent Office Society, April, 1973, page 217, may be found in the files of the committee.]

VIRGINIA STATE BAR,
SECTION ON PATENT, TRADEMARK AND COPYRIGHT LAW,
September 28, 1973.

JOHN L. MCCLELLAN,
*U.S. Senate,
Washington, D.C.*

DEAR SENATOR MCCLELLAN: The Patent, Trademark and Copyright Section of the Virginia State Bar has polled its membership on the five subjects covered in the recent hearings on Senator Hart's bill, S 1321, before the Patents, Trademarks and Copyrights Subcommittee of the Senate Judiciary Committee. The results of the poll are shown in the attached report.

Our questions were essentially the same as those used in a parallel poll by the PTC Section of the D.C. Bar, except for our addition of supplemental questions 4(a) and 4(b), so that the results of the two polls may readily be compared or combined. Approximately 30% of our membership responded in time for inclusion in this report.

Patent lawyers are interested in the improvement of the patent system, both in the Patent Office and in the courts, and favor changes that do more good than harm. Thus, the responses to our poll favor a number of changes, but indicate a desire that each change should be carefully considered to give the desired end result, rather than a net adverse effect. For example, a majority favored maintenance fees, but not if they are so high as to be unduly burdensome.

This submission on behalf of our section is offered for inclusion in the record of the hearings.

Very truly yours,

JOHN F. C. GLENN, *Chairman.*

POLL OF MEMBERS OF THE PATENT, TRADEMARK & COPYRIGHT LAW SECTION
OF THE VIRGINIA STATE BAR ON FIVE ASPECTS OF HART BILL S 1321

ADVERSARY PROCEEDINGS

1. Are you in favor of providing for adversary proceedings in the United States Patent Office with the opportunity of the public to participate in the examination

Yes 17 No 9

Pro: Majority favored adversary proceedings in order to be of assistance to the Patent Office in uncovering prior art and strengthening presumption of validity of patents; however, many of the majority wish to have adversary proceedings limited so that the time and money involved will not be prohibitive.

Con: Minority indicated that cost of additional adversary proceedings would be so expensive that parties having economic leverage would be able to harass the small business man. In addition, the cost to the taxpayers for an adversary proceeding was thought to be excessive as compared to the benefits obtained.

PUBLIC COUNSEL

2. Are you in favor of a public counsel participating in an examination proceeding?

Yes 6 No 22

Pro: In favor of public counsel are a small minority who believed that a public counsel would enhance the presumption of validity of a patent. However, many of the minority qualified their views, e.g.: (a) only at the request of the Examiner, (b) only when no other member of the public enters into an adversary proceeding, and (c) only to the extent of submitting additional prior art to the Examiner.

Con: The substantial majority were against public counsel and considered such an institution to be redundant to the function of the Patent Examiner, and one which would cast a bad reflection on the work product of the Patent Office and lead to morale problems.

DEFERRED EXAMINATION

3. Are you in favor of deferred examination before expiration of five years from the filing date?

Yes 10 No 15

Pro: The minority who were in favor of deferred examination based their opinion on the assertion that similar systems have worked well in foreign countries, that the cost of prosecution could be delayed until the time of commercial acceptance of the invention, and that the load on the Patent Office would be reduced so that the Patent Office would be able to focus attention on more important matters.

Con: Against deferred examination was a majority who believed it would create great uncertainty on the part of industry as to the extent of patent protection for disclosed inventions. Furthermore, many indicated that because the reduced backlog in the Patent Office, there was no real justification for deferred examination.

MAINTENANCE FEES

4. Are you in favor of maintenance fees?

Yes 16 No 14

Pro: The consensus of the members in favor of maintenance fees emphasize that they were in favor *only* if such fees are not exorbitant. The fees should be fairly tied to the cost of helping maintain the patent system and to hold down the cost of applications. Many felt that such reasonable fees would help identify live or productive patents. The individual inventor and smaller companies are more able to pay additional fees several years after the patent has been in force and used.

Con: Those members against the concept of maintenance fees, cited most often that it would discourage private inventors and small companies from filing patent applications in the first instance. Another point raised against maintenance fees was that the public's responsibility should not be forgotten since the quid pro quo for the exclusive right for a limited time to exclude others is the full disclosure of the invention. Further, it was pointed out by some that it would be unfair to tax patents on all inventions alike when they produce different results in terms of profit for the parties concerned.

4(a). Would you be in favor of maintenance fees in magnitude of \$1,000.00 per year with twenty-five percent increase each year?

Yes 1 No 29

Pro: One member felt that the "commercially meaningless" patents should be so eliminated.

Con: The point made by the overwhelming majority in voting against this provision is that the amount is excessive and would stifle the patent system. Secrecy of technology would be the way of life in the United States in the opinion of several of the members. The amount is not fairly related to the cost of maintaining the patent system.

4(b). Would you be in favor of a single maintenance fee in magnitude of \$500.00 at the end of the eighth year?

Yes 12 No 15

Pro: This "compromise" was favored by slightly under half of the members responding. It seems that this amount would be sufficient to eliminate the "dead wood" in the issued patents thereby certainly opening more technology to the public domain. It would assist in fiscal maintenance of the patent system, but is not too burdensome for small inventors and small companies that have been able to place their patents into the economic main stream.

Con: Those opposed to the maintenance fee "compromise" felt that the present system of expense recovery is sound. Some favored nominal maintenance fees, but expressed concern that possibly the eighth year was too soon to provide the owner with the necessary time in all cases to sufficiently commercialize the invention.

INDEPENDENT AGENCY

5. Are you in favor of the Patent Office becoming an independent agency?

Yes 18 No 5

Pro: The consensus here was that the Patent Office would be strengthened by making it an independent agency. Members cited the conflicts of recent Commissioners with the Commerce Department hierarchy and the fact that the present several agencies' views could better be brought together in a single agency resulting in an agreement on a patent policy that is workable. It is thought that an independent agency with Secretary status would also be able to work more closely with Congress when needs arise.

Con: The present system has not presented major problems. A compromise, such as Assistant Secretary of Commerce status for the Commissioner of Patents, is suggested by some. Avoidance of direct budget cuts is seen by some to be an advantage of remaining under the Commerce umbrella.

McLEAN, VA.,
September 26, 1973.

Re S. 1321—five points included in the hearings of September 11, 12, and 14, 1973.

Senator JOHN L. McCLELLAN,

*Chairman, Senate Judiciary Committee,
Subcommittee on Patents, Trade Marks and Copyrights,
Washington, D.C.*

DEAR SENATOR McCLELLAN: The comments presented in this paper are based on my 36+ years of service in the United States Patent Office. During those years I came into close contact with nearly all operating areas of the Patent Office. In addition to basic service in the patent examining professional corps, I served as a Designs Examiner, as a Trade Mark examiner, as a Patent Classifier and as an acting member of the Board of Appeals. In August, 1965, President Lyndon B. Johnson appointed me to be Assistant Commissioner of Patents. My appointment was continued by President Richard M. Nixon in 1968 and in 1972. Also, I have been active in international patent and patent classification matters, serving as chairman of the Technical Cooperation subcommittee of the Patent Cooperation Treaty Interim Committee and chairman of the 12-nation Joint ad hoc Committee of the Council of Europe and the World Intellectual Property Organization on the International Classification of Patents.

I resigned as Assistant Commissioner and retired in May, 1973.

In quick overview, my position on the five points considered at the hearings is:

I. I support modification of patent examining procedures to provide public opposition or adversary proceedings.

II. I oppose the creation of the Office of Public Counsel.

III. I oppose the establishment of a system for Deferred Examination of Patent Applications.

IV. I oppose the establishment of Maintenance Fees.

V. I favor administrative restructuring of the Patent Office, including the proposed establishment of the Office as an Independent Agency.

I will address each of the five points, briefly, to explain my position.

I. I believe that only those patent applications which have been either, (a) passed to issue ("allowed") by the examiner, or, (b) appealed by applicant from an adverse holding by the examiner, should be opened for public opposition. Those patent applications which are rejected or refused by the examiner, and in which no appeal is taken by the applicant, do not enter into the patent grant arena; no further public or private funds or manpower should be expended on such applications. Appealed applications should be subject to opposition proceedings so the entire question of patentability under the law can be settled in one further proceeding in the Patent Office.

Before my retirement I advocated institution of public opposition proceedings by permitting applicants whose applications had been passed to issue by the examiner to opt for publication of the allowed application under a system which would invite public involvement. My view was that this could be done by the Commissioner under existing law. I also advocated public involvement in "public use" proceedings (Patent Office Rule 292) and in reissue applications especially where the parent patent was involved in litigation.

A period for public opposition and the proceedings thereunder should be such as to consolidate all oppositions and hear the matter in but one proceeding; this would minimize or eliminate harassment possibilities.

II. I oppose the creation of the Office of Public Counsel. The purpose supposedly is to weed out and eliminate frivolous or fraudulent claims for patentability. In hindsight, it may be easy to pick examples of patents whose applications might have been challenged by a public counsel. However, while an application is still only pending, it is a well-nigh impossible task to identify such candidates for attention by the public counsel. The counsel could not intervene in each of the 100,000+ applications now being filed each year. Intervention in less than all could (and probably would) be challenged as discriminatory or retaliatory or political.

A far better way to accomplish the weeding out process is the use of public adversary or opposition proceedings on allowed, appealed or reissue applications.

III. The usual justification for a deferred examination system is to lighten the case load on the examiner and thereby increase the quality of the examination. A basic assumption here is that the number of examiners funded by appropriations would remain at today's level. There is no assurance of such a manpower level continuation. To the contrary, based on my long experience in the budgetary process of the Federal government, the odds are strongly in favor of a cut in authorized staff and appropriations if the workload drops. Indeed, in the past several years, in the face of rising numbers of applications filed each year, Patent Office requests for increases in examiner staff have been denied or reduced, variously at the Secretarial, O.M.B. or Congressional level. No reasons have been advanced to show that this budgetary situation will be different under a deferred examination system.

Much has been said lately about a "quota" or goal systems for examiners that compels them to spend too little time on each application, thereby lowering quality of examination. This effect has been alleged in view of the constant increases in new filings and the necessity to keep output abreast of the input. True, the Patent Office uses productivity measurement systems in several areas of its operations. Such systems are fostered by any good and reasonable management in government or in private industry. However, and very importantly, the individual productivity measurement system has not been tied to the annual output expectancy of the Patent Office Examining Corps as set forth in annual appropriation requests. The expectancy figure for any individual examiner docket has been constant even though the Office expectancy has moved up, for example, from 104,000 in the FY 1971 Congressional budget submission to 118,000 in the FY 1973 submission.

The Patent Office relies primarily on two factors to achieve increases in output of examined applications: (1) increasing the staff as permitted by the budgetary process, and (2) achieving real-time savings in examination such as by making a thorough and complete first search and action, pointing out how claims may be amended to make them allowable, and acting on all applications in order of their filing date.

Therefore, it is not believed there is undue pressure on the examiner which a deferred examination system would obviate.

Also, much has been said about the quality of issued patents. However, the patents in litigation now or litigated in the past several years generally have received their examination many years ago. The new examination procedures adopted since 1964 could well result in higher quality. In any event, it should be remembered that the Patent Office, as an administrative agency under the patent law (35 U.S.C.), examines only for patentability under the law. The courts are the final testing ground for validity. A patent may be declared invalid or unenforceable on grounds not available to the Patent Office to refuse the issuance of a patent.

It is my belief that a deferred examination system will not make any significant change in the quality of issued patents.

Consideration should be given, however, to deferring the examination of foreign-filed U.S. applications where the priority application is in a deferred status in its home country. This could affect up to about 25% of all filings in the United States Patent Office.

An irreversible high-cost impact of any deferred examination system is that all patent applications would be published and consequently would have to be classified and copies thereof placed in the search files. This increases the input to the files by about 50% over the present full examination system which eliminates about 32% of all applications. The eliminated applications have little value as a prior art disclosure because they are obvious improvements or are completely anticipated by already existing reference material in the search file. When placed in the file, permanent storage space requirements are a liability and the examiner loses time looking at publications which are merely duplicative. Here again, it is not seen that a deferred examination system compares favorably with full examination.

V. I favor independent status for the Patent Office, particularly if it would make the budgetary system more realistic and more responsive to the needs of the Office. Further, the present 4 statutory commissioners should be replaced by a 3 or 5 person commission with commissioner serving a 3 or 5 year term on an overlapping basis. This would provide a desperately needed continuity of administration.

Respectfully,

RICHARD A. WAHL
Former Assistant Commissioner.

ORCHARD LAKE, MICH.,
September 20, 1973.

Re Hart Bill S. 1321.

Mr. THOMAS C. BRENNAN,
Chief Counsel, U.S. Senate Committee on the Judiciary, Subcommittee on Patents, Trademarks and Copyrights, Washington, D.C.

DEAR MR. BRENNAN: I am a patent attorney practicing patent law in the State of Michigan. I would appreciate it if you would consider my comments on Bill S.1321. These comments may be broken down into the following subject areas:

- (1) Modification of patent examination proceedings to provide public adversary hearings—
- (2) The creation of the Office of Public Counsel—
- (3) Establishment of a system for deferred examination of patent applications, and
- (4) Revision of the patent fee schedule including establishment of maintenance fees.

Concerning Item I, the modification of patent examination proceedings to provide public adversary hearings, I believe it would be more advantageous to institute mandatory opposition proceedings in which interested third parties

may forward their comments to the Patent Office in order to question the patentability of allowed but pending applications. These opposition proceedings should contain the following features:

(1) Every application shall be automatically opened up for inspection and copying after the Notice of Allowability.

(2) Notice of access to such applications shall be simultaneously published in the Official Gazette along with a representative figure of the drawings, the broadest claim and a list of references cited.

(3) The public shall have a limited period (at least three months) beginning from the date of the Official Gazette notice to protest the grant of a patent.

(4) Prosecution shall be suspended during the protest period.

(5) If the submitted evidence is considered to be probative and relates to public use or sale of the invention more than one year before the filing of the application, inter partes public use proceedings outlined in present Rule 292 should be followed.

(6) If submitted evidence is considered to be probative and relates to publications and patents not cited by the Patent Office or to the manner in which cited art has been applied, examination shall be reopened.

(7) If the submitted evidence is considered to be not probative, the protesting party shall be so notified and a Notice of Allowance shall be issued in due course. The protesting party shall have no right to appeal from this adverse decision.

(8) If the examination is reopened the applicant shall be allowed to amend his claims, submit new claims, or argue the propriety of the new rejection. After a final decision on patentability by the Patent Office, the applicant, if the decision is adverse, shall be given the right to appeal along presently provided channels. The applicant shall be provided with copies of all papers forwarded to the Patent Office during the protest period.

(9) Identity of the protesting party shall not be revealed to the applicant unless the protesting party insists that he be identified.

(10) A provision must be provided that in any subsequent litigation involving a patent issuing from the protested application that there shall be no estoppel or res judicata based on participation or lack of participation in opposition proceedings relating to the application that subsequently matured into the patent. Such a provision would be in accordance with present legal standards since the protesting party had no right to appeal the Patent Office decision on the submitted evidence and had no right to rebut comments made by the applicant regarding the submitted evidence.

(11) There should be no governmental fees required in connection with the opposition proceedings and all parties shall bear their own costs.

(12) Following issuance of the patent the patentee shall have the right in an infringement action to recover damages for infringing acts occurring during and after the protest period. Such right should be subject to the following two conditions:

(a) the claim sued upon shall be substantially identical to a claim appearing in the application at the time it was opened up for inspection, and

(b) the infringer shall have received an actual Notice of Infringement which was transmitted after the application was opened for inspection.

Concerning Item 2, the creation of the Office of Public Counsel, it is my opinion that such a bureau is not needed. As patent laws presently stand the examiner fulfills this position by determining patentability. His decisions are in turn reviewed by the primary examiner which are in turn reviewed on a periodic basis by other agencies of the Patent Office. The addition of a Public Counsel could only add extra expense to the already overburdened applicant. It should further be appreciated that an adversary proceeding does not exist in the Patent Office at this time. Applicant's counsel is required to present all information in his possession to the Patent Office which he believes is relevant to the question of patentability and which was not uncovered by the Examiner. In the absence of performing such a task applicant's attorney is subject to disbarment and the patent may be invalidated for reasons of fraud in the procurement. If it is truly believed that the examining procedure is not as adequate as it should be, then more time should be provided to the examiners to make a more thorough investigation on each application.

Concerning Item 3, the establishment of a system for deferred examination of patent applications, I am in favor of such a system. I believe that the

deferred examination would provide applicant with the time needed to determine the commercial value of his invention. In this manner he may decide to drop certain ideas which at the time of filing appeared to be commercially viable but subsequently proved to be of no commercial value. A deferred examination period should exist for a *minimum* of three years after filing. If the deferred examination proceeding is instituted for a three-year period it would be preferable to change the term of a patent from 17 years from the issuance date to 20 years from the filing date.

Concerning Item 4, I am against the establishment of maintenance fees for patents. Such fees would put an undue burden upon the patent holder in that he would be required to periodic review of all patents in his portfolio to determine which patents were being used, which patents weren't being used and which of those patents that weren't being used would not be used at some subsequent date. Further, an individual private inventor would be required to pay maintenance fees on patents which he was trying to develop or market at a time when he was least able to afford such fees.

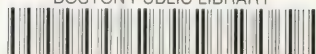
I hope the above comments will provide some aid to you and the members of the Committee in determining the future of the patent system in the United States. It is recognized that certain portions of the system could and probably should be modified. It is further recognized however that the U.S. Patent System has been instrumental in its present state in bringing the United States of America to the forefront as a world leader in new technology. Major modifications to the system would appear to be detrimental to such continued leadership.

Sincerely,

JOHN W. YAKIMOW.

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